

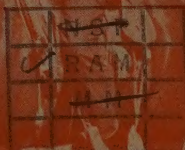
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PERIOD ENDING DECEMBER 31, 1957



STATE OF CALIFORNIA
GOODWIN J. KNIGHT, Governor
HAROLD J. POWERS, Lieutenant Governor

QUARTERLY BULLETIN

Volume XLVII

Number 2

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ANNUAL REPORT—1957

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OUR COVER: California ranks seventh in the United States as a cattle-producing state and produces approximately 4 percent of the Nation's beef. In 1957 the State Legislature enacted the California Beef Council Law which created the California Beef Council to promote the sale and consumption of beef and beef products. See pages 81 and 105. Photo, courtesy of Western Livestock Journal, Nelson R. Crow Publications.

The *Quarterly Bulletin*, published as a contribution to the welfare of California Agriculture, is mailed free to California citizens interested in the work of the Department of Agriculture. The *Bulletin* is exchanged, on request, for publications of the Federal Government, Experiment Stations, and other state or national agricultural offices or organizations.

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THE HONORABLE GOODWIN J. KNIGHT, Governor of California

Report of the Director

W. C. JACOBSEN, *Director of Agriculture*

It is not our purpose in this introductory statement to do more than to pinpoint a few happenings during 1957. To do otherwise would detract from the excellent complete reports offered by our staff members covering the effective work conducted under their supervision.

Cash Farm Income Still High

By year's end, it became increasingly clear that cash farm income for 1957 would likely be slightly below the preceding year, unless livestock and poultry and their products should make up the 94-million-dollar decrease reported for crops. In any event, the showing, in all likelihood, would approach if not exceed the 2.8 billions of dollars of the previous year, and maintain California in the number one rank in total cash receipts from farm marketing.

After midyear, the final computations were reported for all crops and livestock for 1956, and revealed the greatest maximum ever reached for California's cash farm income at \$2,837,065,000. Thus, 1957 was the twenty-second year among the past 27 years in which California agriculture achieved the distinction of being first among the states in agricultural value produced in terms of cash receipts from farm marketings.

The great diversity of our production, coupled with the great number of specialty crops, must, of course, be recognized as providing the basis for this attainment. Furthermore, the constant effort to gain greater yield per unit of production has been an important factor. This development also serves appreciably as an offset to the increasing costs of operation.

Our standing in percentage of value of national production continues high, about 45 percent for fruits and tree nuts, 34 percent for commercial vegetables, and 30 percent for major seeds, although only 5 percent for field and forage crops. Production of milk per cow at 8,880 pounds exceeds the national average by about 44 percent; another outstanding figure is our production of 222 eggs

per hen as against a 189 average nationally, or nearly 15 percent higher; also significant is our cotton average of 1,035 pounds of lint per acre as against the national average at about 400 pounds.

Legislation

The 1957 Session of the Legislature enacted 135 different measures which added, amended or repealed provisions of the Agricultural Code. This legislation ranged from minor technical amendments of existing statutes to enactments that reflected substantive changes in policy and programs. Of particular significance, from the standpoint of adding to the duties and responsibilities of the department, were: (1) a new livestock remedy law to be administered by the Department of Agriculture, effective January 1, 1958 (Chap. 2240); (2) provision for the establishment of brucellosis control areas, and for state indemnity for cattle slaughtered under the program (Chaps. 2289, 2299 and 2310); (3) repeal and re-enactment of the California Beef Council Law so as to eliminate the requirement of a referendum, and to substitute therefor provisions for the issuance of certificates of exemption from payment of fees (Chap. 2241); (4) provision for the establishment by regulation of grade sizes and standards of pest freedom for nursery stock (Chaps. 899 and 1315); (5) strengthening of the Produce Dealers Act (Chap. 714); (6) provision for the establishment of a program of origin certification of feed grain as to freedom from weed pests (Chap. 1602); (7) transfer of the regulation of nutria farming from the Department of Fish and Game to the Department of Agriculture (Chap. 1510); and (8) various changes in the producer pricing and fair trade practice provisions of the Milk Control Law.

Marketing

During 1957 there appeared to be increased stability and improved public relations in administering and enforcing the

Milk Control Act. Clarification of legislative standards was helpful in the producer price field, and through results of investigation on quantity discounts, more realistic prices and margins for wholesale and retail distribution of fluid milk were established.

Much interest was displayed in other states and at the national level in the principles and procedures for marketing control programs under California's Marketing Act. Insofar as such self-help enabling legislation was being sought to operate under some form of governmental advisory responsibility, our marketing division endeavored to explain California experiences with our laws to the extent to which these might conceivably be applicable.

Improvement in methods of forecasting crop production through objective sampling techniques came in for increased attention. The cling peach project nears completion; projects involving grapes and pears are under way, and plans are being perfected for lemon products and walnuts, followed by an expression of interest from the almond industry.

In the fall, the California Beef Council Law became effective, and this agency was organized and was ready to proceed with its function of promoting the sale of beef as soon as a manager could undertake his duties. There is comparably in prospect a poultry promotion council. Preliminary discussions indicate that legislation to perfect such a plan might be introduced in the 1958 Session.

Pests and Diseases

Intensive attention to the exercise of plant and animal quarantine functions continues to reward our agricultural industry with freedom from established infestations of the major fruit flies, such as the Mediterranean, Mexican, melon, and Oriental, the two chief cotton pests, namely, the boll weevil and pink bollworm, and in the animal field from infection by rinderpest, foot-and-mouth disease, contagious pleuropneumonia, Asiatic Newcastle disease, and several other disastrous foreign diseases. Increasing emphasis is being placed upon the utilization of pest detection techniques, in order that incipient infestations or infections might be encountered and stamped out before material spread. The continuing infestation by pink bollworm in cotton plantings in Arizona, and the appearance of this pest on the west coast of Mexico, indicate an increasing haz-

ard to the plantings in our desert areas from this pest. Poultry and animal disease detection is comparably served through our several diagnostic laboratories.

Consistent progress attends attempts to eliminate Khapra beetle, citrus white fly, Hall scale, and Meyer lemon, the latter to aid in preventing spread of quick decline of citrus.

Brucellosis suppression continues to gain under new legislation for establishing control areas, already extended to 21 counties, of which Del Norte, in November, 1957, was the first area to be declared modified certified brucellosis free under a federal-state cleanup plan. No vesicular exanthema has occurred among the State's hog population since November, 1955. Scrapie disease of sheep was again cleaned up through slaughter of known infected and exposed animals. Increased attention is being given to bovine tuberculosis in an effort to overcome periodic flareups in certain areas. A re-evaluation of the methods and materials used against this latter disease, based on augmented research, seems indicated. Close watch is being kept of turkey flocks in avoidance of ornithosis infection.

New Activities

Inspection of poultry for wholesomeness, and of poultry processing plants for sanitation, attained fairly complete operation during the year. Enforcement of labeling provisions under the Poultry Classification Law, in co-operation with county agricultural commissioners, was fully undertaken.

Plans have been made to implement the new so-called clean grain provisions through hearings for the adoption of regulations. The regulation will ultimately insure similar cleanliness of feed grains which have been applicable to seed for planting purposes.

Co-operation

The department continues to receive the effective co-operation of the county officers who are associated with the department in its regulatory and service activities, from the State Board of Agriculture in its official advisory capacity, from the farm organizations, the University of California, other state departments, the Federal Government, all of which aid in making our operations more responsive to our duty to protect and promote the agricultural industry of this State.

DIVISION OF ADMINISTRATION

Departmental Personnel Office

CHARLES P. CUSICK, *Personnel Officer*

FRANCIS G. STOFFELS, *Assistant Personnel Officer*

The Personnel Office administers the personnel program for the Department of Agriculture. It maintains employee records, and a roster of employees for payroll purposes, leave, and retirement. Of the 244 California civil service job classifications used by this department, 187 are used exclusively by the Department of Agriculture.

The Personnel Office studies job classifications, surveys salaries, investigates cases requiring disciplinary action, and assists with the departmental training program.

In co-operation with and for California counties, the Personnel Office examines applicants and certifies the names of successful candidates for appointment as county agricultural commissioners, deputy agricultural commissioners, county sealers of weights and measures, deputy county sealers, county agricultural inspectors, and seasonal county agricultural inspectors.

SPECIAL FUNCTIONS

In-Service Training

On November 7, 1957, the first of a series of 15 weekly supervisory training sessions was held. The course, developed by a professor of psychology of the Sacramento State College to meet the needs of the department, emphasizes human relations in supervision.

Thirty departmental training co-ordinators and administrators are receiving this training. At the conclusion of the course, they will plan and give a supervisory train-

ing course of shorter duration to supervisory employees of the department throughout the State.

The Bureau Chiefs' Conference covered the following subjects during the year:

- Enforcement techniques;

- Reports of performance and employee development appraisal;

- Legislative processes and procedures;

- Federal-State co-operative programs;

- Departmental supervisory training program;

- Co-operative relationships between state and county agricultural agencies.

Personnel Office staff members assisted 12 bureaus in planning 20 formal training courses during the year.

Classification

Thirteen specifications of state civil service classifications used exclusively by this department were revised in 1957. In addition, eight new classes were established for the use of this department. The Personnel Office, working with the divisions and bureaus concerned, developed the background material needed to submit these classification matters to the State Personnel Board.

Recruitment

The number of permanent and seasonal employees fluctuates during the year. In February, 1957, there were 1,554 employees, and in September, 1957, there were 2,401. Approximately 1,300 of these employees were permanent, and the others were employed on a seasonal basis.

Examinations

The following is a resume of examinations given by this department, during 1957, to

qualify persons for employment in county agricultural departments and county departments of weights and measures.

<i>Title of examination</i>	<i>Number of candidates</i>	<i>Successful</i>	<i>Unsuccessful</i>
County agricultural commissioner	44	28	16
Deputy agricultural commissioner	62	28	34
County sealer of weights and measures	28	18	10
Deputy sealer of weights and measures	33	22	11
County agricultural inspector	521	284	237
Seasonal county agricultural inspector	24	14	10
Totals	712	394	318

Departmental Accounting Office

C. H. PERKINS, *Fiscal Officer*

M. GALLAGHER, *Assistant Fiscal Officer*

The Accounting Office administers the financial and business affairs of the department. Included are such items as budget preparation and control, automotive management, property inventory controls, internal audit, and building management.

Fiscal controls involve operation in connection with eight funds. Included is the Department of Agriculture Fund, from which operate the various self-supporting functions of the department. Although this fund is accounted through the regular fiscal control agencies as one fund, it requires the keeping of 20 subaccounts in our records in order that the funds for each individual self-supporting function may be earmarked for their particular use.

Another fund peculiar to the department is the "Department of Agriculture Building Fund." This fund was established by Chapter 11, Statutes of 1950, for the purpose of providing a method for investing surplus money in the Department of Agriculture Fund by using these moneys to construct a building for use of the department. The Accounting Office is responsible for the operation of the building, and is concerned with the collection of the monthly rentals, and repayment of the principle amount borrowed, together with interest earned on moneys invested.

An accounting function peculiar to this department is the marketing trust accounting, which involves collection and disbursement of about \$8,000,000 annually on behalf of industry self-help marketing programs. These funds are exempt from usual state controls, such as controller's audit, Board of Control Rules, and the usual budget procedures.

Automotive management involves the department's fleet of 462 passenger cars and 75 trucks and pickups. These vehicles represent those required at remote locations not serviced by the State Pool. Total mileage driven by the department in 1957 was 10,468,010, including 1,806,134 miles of State Pool car use.

The balance of the regular activities of the Accounting Office covers the usual business service functions necessary in the operation of a large department, and consists of the handling of leases, contracts, purchases of supplies and equipment, and control of the property and equipment owned by the various functions. The Accounting Office also acts as the co-ordinating unit in the department insofar as contacts with the other fiscal control agencies are concerned.

Following is a financial statement detailing appropriations, revenue and expenditures for the various funds administered by the department.

Financial Statement

Expenditures for the Fiscal Year July 1, 1956-June 30, 1957

C. H. PERKINS, Fiscal Officer

GENERAL FUND FUNCTIONS	Detail	Subtotals	Totals
ADMINISTRATION.....		\$490,078.38	\$490,078.38
Administration.....	\$459,092.71		
Office Service Unit.....	30,985.67		
DIVISION OF PLANT INDUSTRY.....			2,812,186.46
Administration.....		17,843.86	
Bureau of Entomology.....		935,944.90	
General Entomology.....	298,063.45		
Destruction and Control of Beet Leafhoppers and Host Plants.....	223,000.56		
Hall Scale Eradication.....	22,937.40		
Mexican Fruit Fly Survey and Treatment.....	75,948.68		
Khapra Beetle Suppression.....	179,122.48		
Melon Fly Survey and Treatment.....	137,472.33		
Bureau of Plant Quarantine.....		1,182,995.43	
Bureau of Plant Pathology.....		206,320.44	
Plant Pathology.....	151,440.26		
Quick Decline of Citrus.....	54,880.18		
Bureau of Rodent and Weed Control and Seed Inspection.....		416,846.57	
Rodent and Weed Control.....	107,842.60		
Seed Inspection.....	110,584.12		
Predatory Animal Control.....	198,419.85		
Bureau of Chemistry.....		52,235.26	
Spray Residue Enforcement.....	52,235.26		
DIVISION OF ANIMAL INDUSTRY.....			2,897,376.53
Administration.....		18,607.66	
Bureau of Livestock Disease Control.....		1,578,051.02	
Field Services.....	1,261,026.00		
Livestock and Poultry Pathology Laboratories:			
Petaluma.....	56,815.43		
San Gabriel.....	63,649.66		
Fresno.....	74,408.80		
Sacramento.....	69,050.26		
Poultry Pathology Laboratories:			
Turlock.....	30,649.03		
Lancaster.....	22,451.84		
Bureau of Dairy Service.....		163,564.31	
Bureau of Meat Inspection.....		868,447.79	
Meat Supervision.....	141,402.24		
Meat Inspection.....	727,045.55		
Bureau of Poultry Inspection.....		268,705.75	
DIVISION OF MARKETING.....			1,197,390.97
Administration.....		17,836.75	
Bureau of Markets.....		245,780.06	
General Marketing Service.....	245,780.06		
Bureau of Market News.....		522,059.11	
Supervisory and Field.....	301,360.58		
Fruit and Vegetable Reporting.....	99,137.50		
Hay and Grain Reporting.....	40,057.44		
Livestock, Meat and Wool Reporting.....	52,533.38		
Dairy and Poultry Products Reporting.....	28,970.21		
Bureau of Agricultural Statistics.....		63,013.69	
Bureau of Fruit and Vegetable Standardization.....		278,474.33	
Fruit and Vegetable Standardization.....	218,022.43		
Poultry Meat Standardization.....	60,451.90		
Bureau of Weights and Measures.....		70,227.03	
Subtotal—Support.....			\$7,397,032.34
LESS GENERAL FUND REIMBURSEMENTS.....			663,401.40
Departmental Administration.....	\$241,014.00		
Office Central Supplies.....	9,479.03		
Office Service Unit.....	32,444.57		
Bureau of Entomology.....	5,002.20		
Bureau of Plant Quarantine.....	4,675.24		
Bureau of Rodent and Weed Control and Seed Inspection.....	29,684.00		
Bureau of Chemistry.....	77.74		
Bureau of Livestock Disease Control.....	58,261.99		
Bureau of Meat Inspection.....	55,842.46		
Bureau of Markets.....	206,544.20		
Bureau of Market News.....	15,350.00		
Bureau of Fruit and Vegetable Standardization.....	5,025.97		
Total—Support.....			\$6,733,630.94

Expenditures for the Fiscal Year July 1, 1956-June 30, 1957—Continued

GENERAL FUND FUNCTIONS	Detail	Subtotals	Totals
OTHER CURRENT EXPENSES			\$293,455.06
Federal Cooperative Marketing Research	\$63,115.96		
Salaries of County Agricultural Commissioners	145,659.00		
Moving Expense, Ch. 1/56, Item 44	3,276.74		
Vesicular Eranthema Indemnities	81,403.36		
Total—General Fund Functions			*\$7,027,086.00

* Includes accounts payable, \$274,607.96 and accounts receivable, \$86,051.56.

DEPARTMENT OF AGRICULTURE FUND FUNCTIONS	Detail	Subtotals	Totals
DIVISION OF PLANT INDUSTRY			\$1,000,040.98
Bureau of Plant Quarantine		\$101,746.30	
Nursery Service	\$101,746.30		
Bureau of Field Crops		495,998.33	
Bonded Warehouse Inspection	143.36		
Field Crops Inspection	282,612.53		
Grain Warehouse Inspection	3,603.50		
Terminal Weighing Service	279.86		
Commercial Feeding Stuffs Service	209,359.08		
Bureau of Chemistry		366,375.99	
Chemistry	339,341.48		
Agricultural Pest Control Operators	27,034.51		
Bureau of Rodent and Weed Control and Seed Inspection		35,920.36	
Seed Testing and Certification Service	35,920.36		
DIVISION OF ANIMAL INDUSTRY			847,453.24
Bureau of Dairy Service		173,042.28	
Dairy Service	137,861.39		
Testing and Sampling of Fluid Milk	35,180.89		
Bureau of Livestock Identification		674,410.96	
DIVISION OF MARKETING			3,962,931.26
Bureau of Markets		8,479.55	
Agricultural Producers Marketing Act	8,479.55		
Bureau of Market Enforcement		238,133.35	
Bureau of Milk Control		970,099.27	
Bureau of Fruit and Vegetable Standardization		875,481.52	
Canning Tomato Inspection	821,777.16		
Seed Potato Certification	53,704.36		
Bureau of Shipping Point Inspection		1,652,158.02	
Bureau of Weights and Measures		218,579.55	
Gasoline, Distillate and Oil Inspection and Antifreeze and Brake Fluid Registration	159,250.77		
Public Weighmasters	59,328.78		
Subtotal—Support			\$5,810,425.48
LESS DEPARTMENT OF AGRICULTURE FUND RE-IMBURSEMENTS			\$1,970.02
Bureau of Livestock Identification	275.00		
Bureau of Market Enforcement	62.59		
Bureau of Milk Control	1,632.43		
Total—Support			*\$5,808,455.46

‡ Economic poisons, \$67,869.11; fertilizing materials, \$271,472.37.

* Includes accounts payable, \$233,223.54 and accounts receivable, \$2,595.

Expenditures for the Fiscal Year July 1, 1956-June 30, 1957—Continued

CAPITAL OUTLAY	Detail	Subtotals	Totals
CAPITAL OUTLAY AND SAVINGS FUND			
Major Construction, Improvements and Equipment.....			—\$4,993.55
Bureau of Plant Quarantine.....		—\$4,374.21	
Blythe Station.....	\$105.29		
Benton Station.....	10.00		
Fort Yuma Station.....	—4,489.50		
Bureau of Livestock Disease Control.....		—619.34	
Lancaster Laboratory.....	—491.14		
Fresno Laboratory.....	—128.20		
Minor Construction, Improvements, Repairs and Equipment.....		1,544.62	1,054.41
Departmental Administration.....		—490.21	
Bureau of Livestock Disease Control.....			
Petaluma Laboratory.....	—490.21		
Acquisition of Real Property.....			615.20
Bureau of Plant Quarantine.....		249.74	
Benton Station.....	249.74		
Bureau of Fruit and Vegetable Standardization.....		365.46	
Carpinteria Station.....	365.46		
Preliminary Plans.....			900.00
Bureau of Fruit and Vegetable Standardization.....		900.00	
Carpinteria Station.....	900.00		
Subtotal—Capital Outlay and Savings Fund.....			*—\$2,423.94
FAIRS AND EXPOSITION FUND			
Minor Construction, Improvements, Repairs and Equipment.....			\$4,900.39
Bureau of Livestock Disease Control.....		\$4,900.39	
Lancaster Laboratory.....	\$4,900.39		
Major Construction, Improvements and Equipment.....			50,000.00
Bureau of Livestock Disease Control.....		50,000.00	
Turlock Laboratory.....	50,000.00		
Subtotal—Fair and Exposition Fund.....			\$54,900.39
Total—Capital Outlay.....			\$52,476.45

* Includes expenditures for capital outlay, \$3,175.41, and return of unexpended balances, \$5,599.05.

Revenue for the Fiscal Year July 1, 1956-June 30, 1957

OTHER FUNDS	Detail	Total
DEPARTMENT OF AGRICULTURE TRUST ACCOUNT		
Dairy Trust.....	\$201,122.34	\$206,122.34
California Crop Improvement.....	5,000.00	
STATE DAIRY PRODUCTS TRUST FUND		
Fees.....	458,942.38	467,820.78
Interest and Penalties.....	465.83	
Sale of Books and Pamphlets.....	5,528.30	
Sale of Records.....	2,881.77	
Miscellaneous.....	2.50	
DEPARTMENT OF AGRICULTURE BUILDING FUND		
Rental Income.....	194,671.24	194,696.38
Miscellaneous.....	25.14	

Revenue for the Fiscal Year July 1, 1956-June 30, 1957—Continued

GENERAL FUND FUNCTIONS	Detail	Subtotal	Total
DEPARTMENTAL ADMINISTRATION			
Miscellaneous income.....	\$591.84	\$591.84	\$591.84
DIVISION OF PLANT INDUSTRY			64.70
Bureau of Entomology.....		62.60	
Apiary Brand Registration Fees.....	62.50		
Miscellaneous Income.....	.10		
Bureau of Rodent and Weed Control and Seed Inspection.....		2.10	
Miscellaneous Income.....	2.10		
DIVISION OF ANIMAL INDUSTRY			99,842.52
Bureau of Meat Inspection.....		4,719.26	
Foreign Cold Storage Meat Inspection—Licenses.....	3,640.00		
Foreign Cold Storage Meat Inspection—Fees.....	1,079.26		
Bureau of Dairy Service.....		47,966.86	
Containers Brand—Renewal Fees.....	757.00		
Containers Brand—Registration Fees.....	380.00		
Miscellaneous Dairy Products Factory Licenses.....	10,124.36		
Miscellaneous Dairy Products Factory Licenses—Penalties.....	24.75		
Oleomargarine Licenses—Bakery and Restaurant.....	3,376.00		
Oleomargarine Licenses—Manufacturers.....	1,100.00		
Oleomargarine Licenses—Wholesale.....	10,350.00		
Imitation Milk Licenses—Manufacturers.....	400.00		
Imitation Milk Licenses—Retail.....	1,015.00		
Imitation Milk Licenses—Bakery and Restaurant.....	20.00		
Imitation Milk Licenses—Wholesale.....	800.00		
Imitation Cream Licenses—Retail.....	245.00		
Imitation Cream Licenses—Bakery and Restaurant.....	90.00		
Imitation Cream Licenses—Manufacturers.....	200.00		
Imitation Ice Cream Licenses—Manufacturers.....	400.00		
Imitation Ice Cream Licenses—Retail.....	7,820.00		
Imitation Ice Cream Licenses—Wholesale.....	4,420.00		
Samplers and Weighers Licenses.....	1,979.00		
Samplers and Weighers Licenses—Penalties.....	17.00		
Pasteurizers Licenses.....	2,346.00		
Pasteurizers Licenses—Penalties.....	20.00		
Testers Licenses.....	997.00		
Testers Licenses—Penalties.....	5.00		
Technicians Licenses.....	115.00		
Licenses Modified.....	800.00		
Milk Licenses Penalties.....	25.00		
Miscellaneous Income.....	140.75		
Bureau of Livestock Disease Control.....		7,746.40	
Vesicular Exanthema Licenses.....	6,860.00		
Vesicular Exanthema Licenses—Penalties.....	500.00		
Miscellaneous Income.....	386.40		
Bureau of Poultry Inspection.....		39,410.00	
Poultry Inspection Licenses.....	12,030.00		
Poultry Plant Licenses.....	26,600.00		
Miscellaneous Income.....	780.00		
DIVISION OF MARKETING			204.75
Bureau of Milk Control.....		100.00	
Dairy Producer Exchange Licenses.....	100.00		
Bureau of Market News.....		38.75	
Miscellaneous Income.....	38.75		
Bureau of Weights and Measures.....		66.00	
Miscellaneous Income.....	66.00		
TOTAL—GENERAL FUND REVENUE.....			\$100,703.81

Revenue for the Fiscal Year July 1, 1956-June 30, 1957—Continued

DEPARTMENT OF AGRICULTURE FUND	Detail	Subtotal	Subtotals by bureaus	Total
DIVISION OF PLANT INDUSTRY				\$1,012,562.00
Bureau of Plant Quarantine			\$124,434.07	
Nursery Service		\$124,434.07		
Nursery Licenses	\$104,895.00			
Restoration Fees	1,139.50			
Acreage Fees	2,689.15			
Psorosis Registry Fees	320.00			
Strawberry Certification Fees	10,987.80			
Miscellaneous	819.00			
Interest from Surplus Money Investment Fund	1,651.09			
Interest from Department of Agriculture Building Fund	1,382.53			
Grapevine Registration Fees	550.00			
Bureau of Field Crops			512,765.59	
Miscellaneous Income	14.57	14.57		
Field Crops Inspection		307,420.89		
Inspection Fees	305,315.66			
Cancelled Warrants	35.35			
Interest from Surplus Money Investment Fund	1,152.81			
Interest from Department of Agriculture Building Fund	917.07			
Warehouse Inspection		706.94		
Warehouse Inspection Fees	640.00			
Interest from Surplus Money Investment Fund	36.48			
Interest from Department of Agriculture Building Fund	30.46			
Grain Warehouse Inspection		2,409.19		
Registration Fees	2,390.00			
Interest from Surplus Money Investment Fund	7.80			
Interest from Department of Agriculture Building Fund	11.39			
Commercial Feeding Stuffs Service		201,799.58		
Miscellaneous Collections	116.68			
Feeding Stuffs Service Licenses	15,075.00			
Feeding Stuffs Service Licenses—Penalties	750.00			
Feeding Stuffs Tonnage Tax	183,101.92			
Tonnage Tax Penalties	963.55			
Interest from Surplus Money Investment Fund	927.41			
Interest from Department of Agriculture Building Fund	865.02			
Terminal Weighing		414.42		
Inspection Fees	410.94			
Interest from Surplus Money Investment Fund	1.91			
Interest from Department of Agriculture Building Fund	1.57			
Bureau of Chemistry			340,655.18	
Economic Poisons Service		85,688.41		
Economic Poisons Licenses	59,697.00			
Economic Poisons Licenses—Penalties	440.25			
Economic Poison Analysis Fees	22.00			
Limited Use Sales Licenses	3,315.00			
Limited Use Sales Licenses—Penalties	25.80			
Supplemental Brand Fees—Licenses	20,943.00			
Spray Residue Analysis Fees	28.00			
Interest from Surplus Money Investment Fund	473.15			
Interest from Department of Agriculture Building Fund	393.96			
Miscellaneous Income	350.25			
Fertilizing Materials Service		227,881.22		
Fertilizer Licenses	20,150.00			
Fertilizer Licenses—Penalties	85.00			
Fertilizer Salesman's Licenses	5,433.00			
Fertilizer Salesman's Licenses—Penalties	210.00			
Agricultural Mineral Licenses	8,750.00			
Agricultural Mineral Licenses—Penalties	10.00			
Agricultural Mineral Tonnage Tax	25,390.71			
Agricultural Mineral Tonnage Tax—Penalties	451.81			
Jobbers Licenses	289.00			
Miscellaneous Income	179.00			
Fertilizer Tonnage Tax	160,028.63			
Fertilizer Tonnage Tax—Penalties	1,163.14			
Interest from Surplus Money Investment Fund	3,023.38			
Interest from Department of Agriculture Building Fund	2,717.55			
Pest Control Operators		27,085.55		
Operators Licenses	20,670.00			
Operators Licenses—Penalties	455.00			
Pilots Certificates	5,795.00			
Miscellaneous Income	55.00			
Interest from Surplus Money Investment Fund	60.82			
Interest from Department of Agriculture Building Fund	49.73			

Revenue for the Fiscal Year July 1, 1956-June 30, 1957—Continued

DEPARTMENT OF AGRICULTURE FUND	Detail	Subtotal	Subtotals by bureaus	Total
DIVISION OF PLANT INDUSTRY—Continued				
Bureau of Rodent and Weed Control and Seed In- spection.....			\$34,707.16	
Seed Testing and Certification Service.....		\$34,707.16		
Seed Testing Fees.....	\$34,627.50			
Interest from Surplus Money Investment Fund.....	34.91			
Interest from Department of Agriculture Build- ing Fund.....	44.75			
DIVISION OF ANIMAL INDUSTRY				\$900,962.26
Bureau of Dairy Service.....			165,847.74	
Miscellaneous.....	1,309.00	1,309.00		
Interest from Surplus Money Investment Fund.....	657.13	657.13		
Interest from Department of Agriculture Building Fund.....	529.12	529.12		
Ice Cream Inspection.....		78,562.85		
Ice Cream Factory Licenses.....	78,117.60			
Ice Cream Factory Licenses—Penalties.....	445.25			
Butter Grading Service.....		19,699.41		
Butter Graders Licenses.....	72.00			
Butter Distributors Fees.....	22.47			
Butter Distributors Fees—Penalties.....	2.00			
Butter Cutting and Wrapping Fees.....	19,598.94			
Butter Cutting and Wrapping Fees—Penalties.....	4.00			
Market Milk Inspection.....		62,066.06		
Producers and Distributors Inspection Fees.....	61,835.26			
Producers and Distributors Inspection Fees— Penalties.....	230.80			
Glassware Testing Service.....		3,024.17		
Glassware Testing Fees.....	3,024.17			
Bureau of Livestock Identification.....			735,114.52	
Miscellaneous Income.....	226.66	226.66		
Proceeds from Estray Animals.....	8,198.02	8,198.02		
Cancelled Warrants.....	30.10	30.10		
Sale—Brand Books.....	486.00	486.00		
Interest from Surplus Money Investment Fund.....	4,087.05	4,087.05		
Interest from Department of Agriculture Building Fund.....	3,372.44	3,372.44		
Cattle Protection Service.....		717,891.25		
Hide and Brand Inspection Fees.....	637,491.75			
Brand Recording Fees.....	4,594.00			
Brand Reinstatement Fees.....	4,052.00			
One Year Brand Renewal Fees.....	4,962.00			
Brand Renewal Fees—Multiple Year.....	42,632.00			
Duplicate Certificate Fees.....	7.00			
Slaughterer's Licenses.....	14,557.50			
Slaughterer's Licenses—Penalties.....	76.50			
Public Cattle Sales Yard Licenses.....	7,000.00			
Brand Transfer Fees.....	978.00			
Public Cattle Sales Yard Licenses—Penalties.....	546.00			
Penalties for Use of Unrecorded Brands.....	994.50			
Horse and Sheep Protection.....		823.00		
Horse Transportation Licenses.....	108.00			
Slaughterer's Licenses.....	715.00			
DIVISION OF MARKETING				4,175,033.90
Bureau of Markets.....			9,571.06	
Agricultural Producers Marketing Act.....		9,571.06		
Commission Allowance Prorate Fees.....	8,920.96			
Interest from Surplus Money Investment Fund.....	353.09			
Interest from Department of Agriculture Build- ing Fund.....	297.01			
Bureau of Market Enforcement.....			264,784.12	
Miscellaneous Income.....	162.52	162.52		
Interest from Surplus Money Investment Fund.....	2,351.09	2,351.09		
Interest from Department of Agriculture Building Fund.....	1,952.36	1,952.36		
Cancelled Warrants.....	28.65	28.65		
Produce Dealers Service.....		229,977.50		
Civil Penalty.....	410.00			
Produce Dealers Licenses.....	167,640.00			
Produce Dealers Licenses—Penalties.....	1,850.00			
Brokers Licenses.....	11,440.00			
Commission Merchants Licenses.....	7,320.00			
Agents Licenses.....	11,220.00			
Cash Buyers Licenses.....	29,720.00			
Miscellaneous Income.....	577.50			

Revenue for the Fiscal Year July 1, 1956-June 30, 1957—Continued

DEPARTMENT OF AGRICULTURE FUND	Detail	Subtotal	Subtotals by bureaus	Total
DIVISION OF MARKETING—Continued				
Bureau of Market Enforcement—Continued				
Processors of Farm Products.....		\$30,312.00		
Processors Licenses.....	\$25,480.00			
Processors Licenses—Penalties.....	160.00			
Agents Licenses.....	4,420.00			
Statement of Intention of Finance Fees.....	212.00			
Miscellaneous Income.....	40.00			
Bureau of Milk Control.....			\$1,105,287.87	
Miscellaneous Income.....	22.68	22.68		
Cancelled Warrants.....	25.87	25.87		
Interest from Surplus Money Investment Fund.....	3,871.84	3,871.84		
Interest from Department of Agriculture Building Fund.....	3,238.27	3,238.27		
Fluid Milk and Cream Stabilization.....		792,877.46		
Distributors and Producer Assessments.....	779,399.46			
Distributor Licenses.....	5,046.00			
Distributor Licenses—Penalties.....	408.00			
Civil Penalties.....	8,000.00			
Miscellaneous Income.....	24.00			
Fluid Milk and Cream Sales Stimulation.....		153,451.63		
Sacramento Producers and Distributors Fees.....	30,901.50			
Alameda-Contra Costa Producers Fees.....	69,287.93			
San Diego Producers Fees.....	53,262.20			
Marketing Milk and Other Dairy Products.....		151,800.12		
Ice Cream Manufacturer Assessments.....	149,600.12			
Civil Penalties.....	2,200.00			
Bureau of Fruit and Vegetable Standardization.....			923,566.60	
Canning Tomato Inspection.....		855,376.61		
Cancelled Warrants.....	11.62			
Miscellaneous Income.....	12.50			
Inspection Fees.....	850,435.92			
Interest from Surplus Money Investment Fund.....	2,696.13			
Interest from Department of Agriculture Building Fund.....	2,220.44			
Seed Potato Certification.....		68,189.99		
Certification Fees.....	63,024.00			
Test Plot Fees.....	4,836.00			
Interest from Department of Agriculture Building Fund.....	187.78			
Interest from Surplus Money Investment Fund.....	142.21			
Bureau of Shipping Point Inspection.....		1,589,901.28	1,589,901.28	
Miscellaneous Income.....	5.00			
Inspection Fees.....	1,586,184.48			
Interest from Surplus Money Investment Fund.....	1,962.45			
Interest from Department of Agriculture Building Fund.....	1,749.35			
Bureau of Weights and Measures.....			281,922.97	
Interest from Surplus Money Investment Fund.....	1,648.51	1,648.51		
Interest from Department of Agriculture Building Fund.....	1,414.60	1,414.60		
Gasoline, Distillate and Oil Inspection.....		180,640.50		
Motor Fuel Pump Licenses.....	180,626.00			
Miscellaneous Income.....	14.50			
Registration of Antifreeze.....		2,770.00		
Registration Fees.....	2,760.00			
Registration Fees—Penalties.....	10.00			
Registration of Brake Fluid.....		4,000.00		
Registration Fees.....	4,000.00			
Public Weighmasters.....		91,449.36		
Weighmasters Licenses.....	50,300.00			
Weighmasters Licenses—Penalties.....	2,160.00			
Additional Locations.....	7,240.00			
Additional Locations—Penalties.....	285.00			
Deputy Weighmasters Licenses.....	29,958.00			
Deputy Weighmasters Licenses—Penalties.....	1,012.00			
Miscellaneous.....	12.42			
Interest from Surplus Money Investment Fund.....	315.04			
Interest from Department of Agriculture Building Fund.....	166.90			
TOTAL—REVENUE FOR DEPARTMENT OF AGRICULTURE FUND.....				\$6,088,558.16

**Department of Agriculture Building Fund for the Fiscal Year
July 1, 1956-June 30, 1957**

	Amount	
Balance forwarded from 1955-56 fiscal year		\$72,565.97
Collections:		
Rental Income		179,129.18
Less:		
Expenditures	\$101,561.90	
Transfers to Architecture Revolving Fund	69,000.00	
Return of Principal to Department of Agriculture Fund	75,000.00	245,561.90
Balance as of June 30, 1957		\$6,133.25

Appropriations From General Fund for the Fiscal Year July 1, 1956-June 30, 1957

GENERAL FUND	Balance as of June 30, 1956	Available	Expenditures July 1, 1956 to June 30, 1957	Less reimbursement balance	Prior year expenditures	Add prior year reimbursements	Transfers and lapses appropriations	Balance as of June 30, 1957
Support—Department of Agriculture, Ch. 1/56, Item 41, 1954-55 F. Y.		\$6,348,635.00						
Approved by Executive Orders:								
1957-85		64,977.00						
1957-217		275,000.00	6,496,192.73				\$842,116.00	
Estimated Reimbursements:								
Departmental Administrative Charges.....		241,014.00	241,014.00					
Office Service Unit.....		29,594.00	32,444.57	—\$3,050.57				
Central Supplies.....		6,600.00	9,479.03	—2,879.03				
Bureau of Plant Quarantine.....		3,850.00	3,584.64	265.36				
Bureau of Meat Inspection.....		55,500.00	55,842.46	—342.46				
Bureau of Livestock Disease Control—Pullorum and Paratyphoid Testing.....		51,290.00	58,133.78	—6,843.78				
Bureau of Markets.....		235,717.00	206,544.20	29,172.80				
Bureau of Rodent and Weed Control and Seed Inspection.....		32,000.00	29,684.00	2,316.00				
Bureau of Market News.....		15,350.00	15,350.00					
General Entomology.....		5,000.00	5,000.00					
Bureau of Fruit and Vegetable Standardization.....		7,613.00	5,000.41	2,608.59				
Unscheduled Reimbursements.....			1,320.31	—1,320.31				
TOTALS.....		\$7,371,940.00	\$7,159,594.13	\$19,926.60			\$842,116.00	\$150,303.27
Federal Cooperative Marketing Research, Ch. 1/56, Item 42.....								\$10,856.79
Moving Expense, Ch. 1/56, Item 44.....		\$72,500.00	\$61,643.21					1,222.78
Salaries of County Agricultural Commissioners, Ch. 1/56, Item 48.....		3,799.52	2,576.74					34,534.00
Vascular Exanthema Program, Ch. 1/56, Item 42, 777/55, Item 41.....		145,666.00	111,132.00					18,596.64
Support—Department of Agriculture, Ch. 777/55, Item 40, 1955-56 F. Y.		100,000.00	81,403.36					
Federal Cooperative Marketing Research, Ch. 777/55, Item 41.....		\$233,874.76			\$156,569.68	\$125.34		77,430.42
Salaries of County Agricultural Commissioners, Ch. 777/55, Item 420.....		4,658.46			3,673.07	1,836.54		2,821.93
Support—Department of Agriculture, Ch. 1/54, Item 39, 1954-55 F. Y.		34,443.93			30,726.00			3,717.93
Federal Cooperative Marketing Research, Ch. 1/54, Item 40.....		94,693.61			—180.09		94,873.70	10,473.10
Salaries of County Agricultural Commissioners, Ch. 1/54, Item 392.....		10,473.10					10,473.10	
TOTALS.....		\$381,835.82	\$7,416,349.44	\$19,926.60	\$190,788.66	\$1,961.88	\$151,154.76	\$299,483.76

* Transferred to Department of Agriculture Fund per Section 22 of Ch. 1/56.

Appropriations From the Capital Outlay and Savings Fund for the Fiscal Year July 1, 1956-June 30, 1957

	Balance as of June 30, 1956	Available	Expenditures July 1, 1956 to June 30, 1957	Prior year expenditures	Transfers and lapsed appropriations	Balance as of June 30, 1957
Major Construction, Improvements and Equipment, Ch. 3/52, Item 294						
Bureau of Plant Quarantine, Alhura Station	\$160.80				\$160.80	
Acquisition and Development of Site, Ch. 1/54, Item 281	1,175.83				1,175.83	
Bureau of Plant Quarantine, Fort Yuma						
Major Construction, Improvements and Equipment, Ch. 1/54, Item 283	48.58				48.58	
Bureau of Plant Quarantine, Fort Yuma Station						
Acquisition of Real Property, Ch. 777/55, Item 277			\$249.74			\$ 49.74
Bureau of Plant Quarantine - Boston Station	200.00		365.46			3,619.54
Bureau of Fruit and Vegetable Standardization - Carpinteria Station	3,985.00					
Acquisition and Development of Site, Ch. 777/55, Item 277.5	11,333.89		105.29			11,228.60
Bureau of Plant Quarantine - Blythe Station	133,369.00					133,369.00
Bureau of Plant Quarantine - Blythe Station						
Equipment, Ch. 777/55, Item 277.5	1,200.00					1,200.00
Bureau of Plant Quarantine - Blythe Station						
Major Construction, Improvements and Equipment, Ch. 777/55, Item 278a	46,788.00		10.00			46,778.00
Bureau of Plant Quarantine, Fort Yuma and Equipment, Ch. 777/55, Item 279					490.21	
Major Construction, Improvements and Equipment, Ch. 777/55, Item 279			490.21			
Bureau of Livestock Disease Control - Fence Premises of Paluma Laboratory			128.20		128.20	
Major Construction, Improvements and Equipment, Ch. 777/55, Item 399			4,489.50		4,489.50	
Bureau of Livestock Disease Control - Fresno						
Bureau of Plant Quarantine - Fort Yuma						
Major Construction, Improvements and Equipment, Ch. 971/53, Item 393, E. O. 104655					491.14	
Bureau of Livestock Disease Control - Lancaster Livestock and Poultry Pathology Laboratory			491.14			
Preliminary Plans to Construct Station, Ch. 1/56, Item 422, E. O. E56-221	\$900.00					
Bureau of Fruit and Vegetable Standardization - Carpinteria Station	1,975.00					430.38
Minor Construction, Improvements, Repairs and Equipment, Ch. 1/56, Item 291			1,544.62			
Departmental Administration						
TOTALS	\$108,261.10	\$2,875.00	\$ 2,423.94		\$6,984.26	\$106,575.78

Appropriations From Fair and Exposition Fund for the Fiscal Year July 1, 1956-June 30, 1957

	Balance as of June 30, 1956	Available	Expenditures July 1, 1956 to June 30, 1957	Prior year expenditures	Transfers and lapsed appropriations	Balance as of June 30, 1957
Minor Construction, Improvements, Repairs and Equipment, Ch. 1/56, Item 292		\$4,933.00	\$4,900.39			\$32.61
Major Construction, Improvements and Equipment, Ch. 1/56, Item 292.5		50,000.00	50,000.00			
Major Construction, Improvements and Equipment, Ch. 777/55, Item 278.5—Sacramento Laboratory	\$355.67			\$ 443.45		799.12
Executive Order D35-84, Ch. 777/55, Item 399	13,220.00			6,952.70	\$6,952.70	13,220.00
Major Construction, Improvements and Equipment, Ch. 971/53, Item 288a						
TOTALS	\$13,575.67	\$54,933.00	\$54,900.39	\$ - 7,396.15	\$6,952.70	\$14,051.73

Appropriations From Department of Agriculture Fund for the Fiscal Year July 1, 1956-June 30, 1957

	Balance as of June 30, 1956	Available	Expenditures July 1, 1956 June 30, 1957	Less reimbursement balance	Prior year expenditures	Transfers and lapsed appropriations	Balance as of June 30, 1957
Support—Department of Agriculture Fund, Ch. 1/56, Item 45, 1956-57 F.Y.		185,373,180.00					
Augmented by Executive Order:							
D56-97		137,523.00					
D56-92		22,828.00					
D56-112		243,714.00					
D56-125		36,288.00					
D56-126		208,443.00					
D57-9		115,719.00	\$5,577,826.92				
Estimated Reimbursements:							
Bureau of Milk Control		3,500.00	1,970.02	\$1,529.98			
TOTALS		\$6,141,195.00	\$5,579,796.94	\$1,529.98			\$559,868.08
Support—Department of Agriculture Fund, Ch. 777/55, Item 43, 1955-56 F.Y.		\$413,616.89			\$27,164.34		\$176,452.55
Support—Department of Agriculture Fund, Ch. 1/54, Item 42, 1954-55 F.Y.		123,156.64			- 5,250.71	\$128,407.35	
TOTALS		\$536,773.53	\$5,579,796.94	\$1,529.98	\$21,913.63	\$128,407.35	\$736,320.63

¹ Includes \$42,116 transferred from General Fund.

² \$10 abatement in transit 6/30/57.

Reconciliation of Appropriation Balances for the Fiscal Year July 1, 1956-June 30, 1957

	Available	Actual expenditures	Less reimbursements	Balance financial statement	Less accounts payable	Add accounts receivable	Balance per budget report	Add items in transit	Balance per controller's books
GENERAL FUND									
Support Dept. of Agriculture, Ch. 1/56, Item 41, 1956-57	\$7,329,824.00	\$7,159,594.13	\$19,926.60	\$150,303.27	\$237,908.21	\$470.00	\$ 87,134.94	\$154,942.95	\$67,808.01
Federal Co-operative Marketing Research, Ch. 1/56, Item 42, 1956-57 F. Y.	72,500.00	61,643.21	-----	10,856.79	1,472.75	-----	9,384.04	906.57	8,477.47
Moving Expense, Ch. 1/56, Item 44, 1956-57 F. Y.	3,799.52	2,576.74	-----	1,222.78	700.00	-----	522.78	1,180.39	1,703.17
Southern County Agricultural Commissioners, Ch. 1/56, Item 488, 1956-57 F. Y.	145,666.00	111,132.00	-----	34,534.00	34,527.00	-----	7.00	42,291.00	42,298.00
Veterinary Examiners' Indemnities, Ch. 1/56, Item 43, 1956-57 F. Y.	100,000.00	81,403.36	-----	18,596.64	-----	-----	18,596.64	-----	18,596.64
TOTALS	\$7,651,789.52	\$7,416,349.44	\$19,926.60	\$215,513.48	\$274,607.96	\$470.00	\$ 58,624.48	\$197,507.77	\$138,883.29
CAPITAL OUTLAY AND SAVINGS FUND									
Minor Construction, Improvements, Repairs and Equipment, Ch. 1/56, Item 291-Departmental Administration, Preliminary Plans to Construct Station, Ch. 1/56, Item 422, Carpenteria	\$1,975.00	\$1,544.62	-----	\$430.38	-----	-----	\$430.38	-----	\$430.38
TOTALS	\$2,875.00	\$2,444.62	-----	\$430.38	-----	-----	\$430.38	-----	\$430.38
FAIR AND EXPOSITION FUND									
Minor Construction, Improvements, Repairs and Equipment, Ch. 1/56, Item 292-Major Construction, Improvements, and Equipment, Ch. 1/56, Item 292.5	\$4,933.00	\$4,900.39	-----	\$32.61	-----	-----	\$32.61	\$800.00	\$832.61
TOTALS	\$54,933.00	\$54,900.39	-----	\$32.61	-----	-----	\$32.61	\$800.00	\$832.61
DEPARTMENT OF AGRICULTURE FUND									
Support-Department of Agriculture Fund, Ch. 1/56, Item 45, 1956-57 F. Y.	\$6,141,195.00	\$5,579,796.94	\$1,529.98	\$559,868.08	\$233,223.54	\$2,595.00	\$329,239.54	\$287,487.84	\$616,727.38

Statement of Revenue and Expenditures for the Fiscal Year July 1, 1956-June 30, 1957

	Balance as of June 30, 1956	Collections		Other items	Expenditures		Transferred by controller to State Employees Retirement Fund	Balance as of June 30, 1957
		1956-57	1957-58		July 1, 1956 to June 30, 1957	Prior year expenditures		
DEPARTMENT OF AGRICULTURE FUND								
Nursery Service.....	\$282,382.08	\$56,007.50	\$64,217.55	\$1,081.24	\$99,165.51	\$2,405.60	\$5,978.97	\$296,138.29
Banded Warehouse Inspection.....	5,845.03	545.00		253.77	138.46		2.10	6,239.83
Terminal Weighing Service.....	8.89	412.86		31.77	173.11	2.76		247.53
Grain Warehouse Inspection.....	1,519.21	2,454.87		11.79	3,567.91	-2.17	261.69	158.44
Field Crops Inspection.....	166,241.80	306,507.32		173.81	267,486.17	11,276.83	15,109.25	179,114.68
Commercial Feed and Litter Service.....	149,859.51	201,175.31		173.29	204,863.42	3,837.17	13,433.26	129,652.26
Sanitary and Certification Service.....	3,764.65	34,684.92		140.35	31,138.74	1,208.02	1,675.65	4,467.51
Economic Poisons Service.....	62,172.18	67,492.59		123.46	66,386.92	1,808.57	4,176.62	77,025.12
Fertilizing Materials Service.....	520,342.55	217,737.67	19,479.00	12,276.48	265,543.60	7,400.15	16,706.57	456,001.38
Artificial Pest Control Operators.....	10,018.39	27,033.78	5,175.00	157.72	26,435.54	635.62	1,618.57	8,420.16
Bureau of Dairy Service.....	101,611.61	165,343.25		450.56	134,897.25	3,454.14	8,710.06	120,343.97
Livestock Identification.....	671,502.92	732,059.02	4.00	12,804.46	657,744.76	18,449.96	43,615.96	686,834.72
Agricultural Producers Marketing Act.....	54,375.95	9,307.79		275.00	6,766.10	467.16	429.19	56,274.53
Bureau of Market Enforcement.....	373,494.60	263,074.21		1,253.24	232,921.28	4,454.25	13,325.92	387,500.22
Bureau of Milk Control.....	639,419.29	1,102,200.85		1,339.50				696,203.93
Milk Control.....				1,515.16				
Dairy Service.....					937,454.80	30,096.14	45,988.42	
Canning Tomato Inspection.....	401,125.03	853,380.88		1,819.12	34,694.78	148.63	2,488.25	428,645.31
Seed Potato Testing.....	15,503.95	68,060.55		181.99	812,186.93	7,778.23	11,714.56	27,200.46
Shipping Point Inspection.....	370,800.69	1,588,508.24		1,388.07	52,702.23	814.67	2,929.13	233,322.79
Gasoline, Distillate and Oil Inspection, Antifreeze and Brake Fluid Registration.....	309,471.66	71,131.99	116,512.00	1,080.38	156,849.37	2,764.51	9,783.25	328,798.90
Public Weighmasters.....	28,865.00	62,375.37	28,613.00		57,560.35		2,498.37	37,794.65
Totals.....	\$4,168,324.99	\$5,829,493.97	\$234,000.55	\$20,462.64	\$5,579,656.58	\$229,110.92	\$265,129.97	\$4,178,384.68
Transfer to Department of Agriculture Building Fund, Ch. 11/50.....	2461,168.00	75,000.00						2,086,168.00
Totals.....	\$2,007,156.99	5,904,493.97	\$234,000.55	\$20,462.64	\$5,579,656.58	\$229,110.92	\$265,129.97	\$2,092,216.68

1 1955-56 surplus money interest. 2 Loan payment. 3 Unscheduled reimbursements. 4 Revenue correction. 5 Estimated reimbursements.

Statement of Revenue and Expenditures for the Fiscal Year July 1, 1956-June 30, 1957—Continued

	Balance as of June 30, 1956	Collections	Expenditures	Transfer to State Employees' Retirement System	Balance as of June 30, 1957
BUREAU OF DAIRY SERVICE TRUST PROJECTS					
San Joaquin-Sacramento Valley Market Milk Distributors.....	\$2,416.03	\$7,708.00	\$4,705.24	\$76.56	\$5,342.23
South San Joaquin Operators.....	12,961.01	25,658.61	29,319.57	2,017.92	7,282.13
Northern Counties Operators.....	12,961.01	15.01	46.69		7,282.13
Fresno County.....	253.52	7,200.00	6,300.65	504.48	648.59
Humboldt County and Del Norte County Operators.....	4,188.54	23,806.25	19,690.44	1,318.76	6,985.59
Coast Region Manufacturing Concerns.....	12,411.74	6,010.64	8,146.17	504.48	9,771.73
Sacramento Valley Operators.....	8,502.73	29,788.92	28,729.53	1,977.92	7,569.20
North San Joaquin Operators.....	19,594.44	72,956.87	75,579.35	5,171.86	11,800.10
San Francisco Bay Area Milk Dealers.....	1,451.34	7,552.50	7,144.02	464.99	1,374.83
Milk Dealers and Distributors in Southern California Area.....	3,645.09	8,229.50	7,361.19	504.48	4,008.92
Northern and Central California Milk Products Processors.....	3,106.91	3,875.00	1,498.27	103.56	5,380.08
Salinas-San Luis Obispo Operators.....	3,247.14	6,841.04	8,136.45	504.48	1,447.25
Crystal Cream and Butter Company.....	187.78	1,500.00	879.37		808.41
Subtotal.....	\$71,997.95	\$201,122.34	\$197,536.94	\$13,144.49	\$62,438.86
BUREAU OF RODENT AND WEED CONTROL AND SEED INSPECTION					
California Crop Improvement Association.....	\$9,125.94	\$5,000.00	\$12,469.56	\$918.69	\$737.69
BUREAU OF CHEMISTRY—SPRAY RESIDUE TRUST PROJECTS					
General Spray Residue Trust Project.....	\$8,833.04		\$2,637.28		\$6,195.76
San Diego Spray Residue Trust Project.....	1,437.64		333.77		1,103.87
Los Angeles County Region Spray Residue Trust Project.....	1,094.95		218.66		876.29
Subtotal.....	\$11,365.63		\$3,189.71		\$8,175.92
GRAND TOTAL.....	\$92,489.52	\$206,122.34	\$213,196.21	\$14,063.18	\$71,352.47

	Balance as of June 30, 1956	Collections	Prior year revenue adjustment	Expenditures	Prior year	Transfer to State Employees' Retirement System	Balance as of June 30, 1957
				Advisory Board	Department of Agriculture	Department of Agriculture	
CALIFORNIA DAIRY INDUSTRY ADVISORY BOARD							
Section 746.3, Agricultural Code.....	\$345,607.08	\$467,820.78	\$—1,200.70	\$520,350.16	\$6,663.75	\$3,729.74	\$246,292.84

California Marketing Act and Agricultural Producers Marketing Act for the Fiscal Year July 1, 1956-June 30, 1957

	Balance as of June 30, 1956	Collections	Refunds	Distribution of pool sales proceeds	Agriculture Private Advisory Commission fees	Expenditures	Other items	Balance as of June 30, 1957
CALIFORNIA MARKETING ACT								
Fresh Bartlett Pears	\$13,563.79	\$29,964.01	\$51.49			\$28,098.00		\$15,378.31
Canning and Freezing Cling Peaches Administration	12,218.66	641,684.98	4,157.84			631,834.90		47,910.88
Substandard Date Pool	196,413.59	1,845,098.08	46,184.34			1,800,193.77	\$2,100.00	197,233.56
Silver King Raisin Stabilization Fund		1,255,377.98	216,678.88					1,038,699.10
Cling Peach Crop Survey	15,824.36	30,000.00	720.94			27,192.69		17,911.23
Dates	368.42							368.42
Substandard Date Pool	8.78	2,134,820.23	106.06			2,122,900.40		8.78
Wine	805,737.46	31,500.00	7,297.63			28,003.55	1-100.00	817,551.23
Grape Research	28,535.18	21,938.67	2,142.47			24,128.65		24,524.00
Grapefruit Advisory Board	13,587.23							9,254.78
Fresh Fall and Winter Pears								
Administration	1,297.90	7,603.38	119.64			6,281.72		2,499.92
Sales Promotion	5,044.42	36,824.38	325.01			26,017.62		14,744.38
Canning Fall and Winter Pears	5,461.52	30,982.88				28,939.43		5,086.77
Dry Pack Lettuce	5,423.89	36,563.28	46.35			38,345.32		3,595.50
Marketing Order for Figs								
Administration	20,893.67	41,357.80	14.97			44,265.06		17,971.44
Advertising	3,058.56	18,732.53	35.93			13,040.39		8,714.77
Substandard Fig Pool	23,440.65	149,871.44		\$143,171.11		18,170.82	1-95.00	11,875.16
California Canned and California Green Olives	7,858.85	14.36				2,439.75		5,433.46
Coachella Valley Green Corn	511.64	10.00						511.64
Prunes	60,126.74	571,024.95	969.30			460,887.59		169,364.90
Early Apples	142.82	18,736.58	5,104.60			13,586.37	20.00	336.43
Wine Processors	632.14							632.14
Raisins	69,363.65	442,065.44	360.43			402,563.22	\$700.00	109,205.44
Fresh Plums	4,386.13	40,856.69	107.96			31,691.08		13,643.78
Grape Stabilization	1,481.64							1,481.64
Fresh Peaches	110.50	87,166.31	30.99			83,037.77	\$100.00	3,307.85
Fresh Bartlett Pears Sales Promotion	20,669.43	177,991.07	318.34			139,563.12	4-1,000.00	58,779.04
Lima Beans	28,879.92	52,031.75	144.99			48,347.62		32,439.06
Bedding Plants	325.87							325.87
Lemon Products	135,179.47	188,716.90				264,706.94	\$290.10	59,479.53
Lemon Cash Bond Stabilization Pool	42,186.54	1,502,146.38	1,501,141.20					43,711.42
Lemon Stabilization Pool Proceeds	108,763.46							108,763.46
Lemon Stabilization Pool Processing Charges		1,275.00				1,275.00		
Lemon Crop Survey	13,575.41					3,005.77	\$9.90	10,579.54

Turkey Promotion.....	1,739.95	211,955.57	139.97	192,664.92	20,890.63
Extracted Honey.....	36.53	42,970.52	25.50	32,700.61	10,280.94
Winter Head Lettuce.....	39.90				39.90
Olive Stabilization.....	667.51				318.51
Long White Potatoes.....	243,458.55	605,874.65	38,584.71	349.00	324,150.43
Delta White Potatoes.....	1,463.02	8,924.05	1,717.21	1,700.00	1,089.63
Fresh Asparagus.....	43,128.23	2,497.75	177.70	1,587.23	31,790.65
Processing Asparagus.....	68,058.09	2,223.32	33.22	38,328.45	31,929.74
Bush Berries for Processing.....	8,684.10	44,669.93	124.04	41,746.08	8,408.91
Hardy Pears Promotion.....	3,174.61	18,390.62		10,621.64	10,943.59
California Strawberries.....	18,352.74	137,614.23	4,922.29	125,522.14	13,322.34
Canaloupes.....	2,617.80	47,623.38	6.39	35,509.24	14,725.55
Canaloupes Processors Performance Bond.....		4,000.00	3,000.00		1,000.00
Poultry and Turkey Board as Amended.....					
Administration.....	8,086.14	58,322.72		42,272.40	24,286.46
Olive Stabilization.....	5,364.16	128,821.69		125,885.27	8,100.58
Hops Preliminary Deposit.....		37,729.41	377.13	15,890.73	21,261.55
Winter Head Lettuce.....		1,000.00	155.11	844.89	.00
Brussel Sprouts.....		3,000.00		1,926.39	1,073.61
Summer Lettuce.....		1,200.00			1,200.00
Beef Council.....		750.00			750.00
Totals.....	\$2,077,843.72	\$10,763,479.82	\$1,835,322.63	\$7,472,309.99	\$3,376,329.81
AGRICULTURAL PRODUCERS MARKETING ACT					
Pear Crop Survey.....	\$14,770.56	\$21,388.83	\$1,320.89	\$20,630.01	\$14,420.87
Canning Bartlett Pear Zone No. 1.....	17,437.05	236,705.92		\$7,101.18	57,001.95
Canning Bartlett Pear Trade Stimulation.....	62,099.22	173,981.51		1,819.78	74,807.55
Asparagus.....	957.23				957.23
Totals.....	\$95,264.06	\$432,076.26	\$1,320.89	\$370,244.95	\$147,187.60
Totals—Marketing Trust Account.....	\$2,173,107.78	\$11,195,556.08	\$1,836,643.52	\$7,842,554.94	\$3,523,517.41

¹ Travel advance.

² Return of travel advance.

³ Return of bank loan.

⁴ July collections released in June.

⁵ Unclaimed checks.

⁶ Transferred from trade stimulation.

⁷ Transferred to Pear Zone No. 1.

Division of Animal Industry

DR. J. E. STUART, *Chief*

The United States and California are among the safest places in the world to raise livestock and poultry. The animal industry of California has dual importance: it provides a livelihood for a large segment of our population, and it furnishes wholesome essential animal food products to millions of our people.

The total value of livestock production in 1956 in California, including chickens and eggs, was \$989,971,000, or 35 percent of California's agricultural income for that year.

It is the responsibility of the California Department of Agriculture through the Division of Animal Industry and its bureaus to protect California's livestock and poultry from losses sustained from animal disease, and to assure the public of a wholesome supply of foods of animal origin. Modern methods of fast worldwide transportation, changes in methods of animal husbandry, increased sizes of herds and flocks, and advances in methods of processing and marketing, all tend to increase the problems and duties of our regulatory services.

Much credit is due such agencies as the U. S. Department of Agriculture, county livestock sanitary officials, state and municipal health officials, practicing veterinarians, and other enforcement agencies for their fine co-operation and assistance.

A primary responsibility of the division is enforcement of those provisions of the Agricultural Code which relate to prevention, control and eradication of diseases of livestock and poultry, including laws and regulations pertaining to the introduction of livestock and poultry, quarantines, diagnostic tests, vaccinations and inspections. California's system of six diagnostic laboratories, outstanding in the Nation, furnishes a first line of defense in the control and eradication of diseases of our domestic animals and poultry. (Bureau of Livestock Disease Control.)

The division enforces standards relating to wholesomeness and quality of milk and milk products, and enforces laws to prevent deception in the advertising and sale of dairy products and to prohibit fraudulent practices in the purchase of milk and cream. (Bureau of Dairy Service.)

The division enforces those provisions of the Agricultural Code which require that slaughtering and processing of meat and meat food products in counties of over 28,000 population be done in establishments operating under federal, state, or state-approved meat inspection. (Bureau of Meat Inspection.)

The division enforces state laws relating to livestock, particularly recording of livestock brands, inspection of cattle for ownership when sold and slaughtered, investigation of livestock theft, the prosecution of offenders, and the collection of fees for beef promotion. (Bureau of Livestock Identification.)

The division enforces laws relating to the license and sanitation provisions of the Agricultural Code pertaining to plants slaughtering poultry and rabbits and processing the meat thereof, the training and licensing of poultry meat inspectors, and the inspection and proper marking of poultry and rabbit meat for wholesomeness. (Bureau of Poultry Inspection.)

The 1957 Legislature augmented the calf vaccination program by adopting new statutes providing for the eradication of brucellosis on the area plan. This development launched the department on another statewide disease control program of major importance, and in conformity with the brucellosis eradication programs effective in most other states.

Major outbreaks of scrapie disease in sheep were promptly diagnosed and eradicated. The disease occurred on three premises, and involved one of the largest and more prominent purebred flocks, as well as one of the larger commercial flocks of the State. The ramifications of these outbreaks required attention to 300 premises where eradication measures were taken, and where scrapie surveillance was maintained.

A major accomplishment of the Bureau of Poultry Inspection consisted in a survey of all licensed poultry processing plants and the notification to the owners to correct deficiencies in plant construction, condition and facilities found as the result of the surveys. This project resulted in a legal attack on the constitutionality of the law.

DIVISION OF ANIMAL INDUSTRY

DR. J. E. STUART, *Chief*



Dairy Service
Livestock Disease Control
Livestock Identification
Meat Inspection
Poultry Inspection



Bureau of Dairy Service

O. A. GHIGGOILE, Chief

A. E. REYNOLDS, Assistant Chief

It is the responsibility of the Bureau of Dairy Service to enforce the provisions of Chapters 1 to 10, inclusive, of Division 4 of the Agricultural Code of California, known as the Milk and Milk Products Act of 1947, and the rules and regulations promulgated thereunder.

Market Milk Program

The bureau has direct supervision over the activities of approved milk inspection services designated by the Director of Agriculture to carry out the provisions of the Agricultural Code pertaining to market milk and related products. The total number of surveys, inspections and investigations made on these approved services during the year 1957 was 460.

During the year, the City of Sacramento combined its public health activities with the County of Sacramento, creating a single approved milk inspection service for the entire county. The same situation applies to Alameda County, with the exception of the City of Berkeley, in that the Cities of Oakland and Alameda consolidated their public health activities with the county health department. Before Alameda County took over the work for these two cities, the department conducted an established milk inspection service in the County of Alameda, excluding, however, the Cities of Oakland, Alameda and Berkeley. The action of the county in taking over inspection in Oakland and Alameda prompted the department to withdraw its established service in the county.

The Agricultural Code of California gives the Director of Agriculture authority to designate the city or county to do dairy farm inspection in counties where two or more agencies are involved. During the year, requests were made for hearings involving dairy farm inspection areas in Orange, Riverside, San Bernardino and Sonoma Counties. A review of the evidence submitted at the hearing indicated that no changes were desirable in the Counties of Riverside and

San Bernardino, but slight changes in areas were made in Orange and Sonoma Counties. The department now conducts graded market milk activities in 23 counties. This work is conducted on a basis comparable to work conducted by local milk inspection services.

Due to lack of personnel and equipment at the Sacramento laboratory, the bureau has contracted with five outside laboratories for analysis on samples of market milk produced and processed in established milk inspection areas. During the year, these laboratories conducted 15,462 bacteriological and chemical determinations on 6,923 samples of market milk and cream. In addition, 12,266 samples were collected and forwarded to the Sacramento laboratory for analysis, and 19,857 labels for market milk were examined for accuracy. Field tests were made to determine the quality and composition of the products. These tests consisted of 372 lactometer readings, 5,351 flavor and odor tests, 3,735 sediment tests, 4,376 temperature tests, and 118 phosphatase tests. These tests were made during the 6,101 inspections and visits of market milk dairies.

Bacteriological examinations of milk and cream purchased on the basis of bacteria counts must be conducted by technicians licensed and supervised by this bureau. Fifty-three investigations were made in 1957 on the accuracy of the work of 89 licensed technicians.

Employees in laboratories maintained by approved milk inspection services must qualify through an examination pertaining to the bacteriological and chemical examinations of milk and cream. Successful applicants receive a certificate of proficiency in market milk analysis. Twenty-eight such certificates were issued in 1957. There were 95 checks or examinations made on holders of such certificates, and 1,880 investigations of laboratory equipment.

Receiving Point Inspection

Examinations for quality are made on milk for manufacturing purposes upon arrival at

the milk products plants. Determinations on manufacturing milk are made by the use of the direct microscopic count, sediment tests, temperature and odor tests, and on cream by the modified volumetric acidity tests, sediment tests and flavor and odor tests.

During the year 1,768,800 lots of milk and cream were examined for quality by the use of 76,492 microscopic examinations, 669,180 temperature tests, 803,871 flavor and odor tests, 701,139 sediment tests and 353 acidity tests. In addition to these quality tests, 11,951 lactometer readings were made for the purpose of detecting milk adulterated by the addition of water.,

The grading of milk and cream produced for manufacturing purposes, and inspection of dairy farms producing such products, is made possible through voluntary trust fund agreements between dairy products processors and the department. In addition to these trust fund agreements the county board of supervisors for the County of Fresno has for several years entered a voluntary agreement with the department for one full-time man in the County of Fresno. However, due to decrease in the production of milk fat for manufacturing purposes and the expansion of the market milk program in the County of Fresno, this agreement was terminated on December 31, 1957. The entire cost for the grading of milk and cream produced for manufacturing purposes is paid by the processors. Through these agreements, 20 dairy inspectors are employed. This is a decrease of five inspectors from the previous year, due to the sharp drop in the production of milk fat for manufacturing purposes.

A total of 2,704 visits were made to milk products plants for quality determinations on milk and cream, and 29,697 inspections were made of dairy farms.

The sale of milk and cream was suspended from 48 dairies until they were restored to a proper sanitary condition.

As the result of quality determinations on the products, there were 20,086 lots of milk, representing 1,338,558 pounds, and 26 lots of cream, representing 265 pounds, condemned as unfit for human consumption.

Frozen Milk Products Program

In 1957, 1,673 firms were licensed to manufacture frozen milk products, namely, ice cream, ice milk and sherbet. Frozen milk product samples for laboratory analysis are collected at point of manufacture, distribution and retail. All samples are forwarded to

the Bureau's Sacramento laboratory, where bacteriological and chemical determinations are made with specific reference to bacteria, milk fat, stabilizers and food solids.

A total of 8,380 samples were collected for analysis, and 5,759 lots of frozen milk products examined for quality. Considerable time is devoted to the review of the advertising and labeling of these products as shown by the 19,190 investigations made in 1957. To determine the amount of food solids contained in the ice cream and ice milk, it is necessary for the field staff to make an accurate weight determination when the product is sampled. During the year, weights were made on 4,934 units of ice cream and ice milk.

A novel service to small and medium sized ice cream factories has appeared. This is an ice cream sandwich filling and wrapping machine that can produce up to 4,200 dozen untouched ice cream sandwiches per day. The equipment is rented with an operator on a day basis. It is connected to the ice cream freezers. After a day or two of operation, it is moved to another factory. This machine has eliminated a slow, tedious, wasteful and sometimes unsanitary operation in several factories.

Butter Control Program

Quality determinations and laboratory results are largely used for the control of composition and labeling of butter. During the year, 8,069 samples of butter were scored and examined for quality, and 323 samples forwarded to the laboratory for analysis. There were 2,054 lots of butter investigated for correctness of weight, and 7,728 butter brands and labels examined. For the year 1957, 72 butter graders were licensed, 552 checks or examinations were made on the accuracy of their work. These butter graders were maintained in 27 plants cutting and wrapping butter, and in 17 plants distributing butter received in packaged form from out-of-state plants. It is the responsibility of these licensees to make certain that the butter is wrapped according to its grade. Failure to meet quality determinations resulted in the impounding of 12,556 pounds of butter, as compared with 61,893 in 1956.

A butter packaging plant completed during the year is windowless, has mechanical air circulation, print room walls of polyvinyl coated cement blocks, tile floors and lower walls, and has a storage capacity of about 80 carloads of butter.

Cheese Control Program

Certain varieties of cheese are defined by the statutes proper and are known as established varieties. All other varieties of cheese are classified as special varieties, and may be sold only after standards of composition and label requirements are established by the director after a hearing. Such standards must conform as closely as possible to federal standards. There were 612 samples of cheese products collected for laboratory analyses, and 20,893 labels and brands examined for accuracy. Quality determinations were made on 1,144 lots of cheese, resulting in the impounding of 10,785 pounds for failure to meet required standards.

General Products Inspection

Products such as concentrated milk, evaporated milk, condensed milk, both whole and skim, whole milk powder, skim milk powder, acidophilus milk, modified milk, buttermilk, cultured buttermilk, nonfat milk, milk fat, sterilized milk and cream, whip cream topping, cream dressing, eggnog and flavored milk drinks are included in this group. Samples of these products, together with certain ingredients used in their manufacture, are collected for analysis. A total of 2,159 samples were collected, and 8,488 lots examined for quality and labels. Failure to meet certain requirements resulted in the rejection of 246 lots. There were 3,865 lots of various ingredients used in the manufacture of these products examined for quality. Thirty lots were retained for corrections, and 75 samples submitted to the laboratory.

Licensing of Imitation Products

During the year a new product designed as a substitute for a milk product appeared on the market. It is sold as "mocha mix" and designed to take the place of light cream or half and half. Being an all-vegetable product, it does not come within the classification of an imitation milk product according to a ruling made by the courts in connection with a pressurized all-vegetable product. Imitation products include imitation milk, imitation cream, imitation ice cream, imitation ice milk, imitation whip cream topping, powdered imitation milk (used chiefly for the feeding of infants, most frequently on the prescription of a physician) and oleomargarine. During the year, 729 investigations were made concerning these products. At the end of the fiscal year ending June 30, 1957, licenses were issued to

11 manufacturers of oleomargarine, 207 to wholesale dealers, 1,691 to bakers and restaurants, 4 to manufacturers of imitation milk, 16 to wholesale dealers, 203 to retailers, 10 to bakers and restaurants, 2 to manufacturers of imitation cream, 1 to wholesale dealer, 20 to retailers, 49 to bakers and restaurants, 4 to manufacturers of imitation ice cream and imitation ice milk, 76 to wholesale dealers and 1,688 to retailers. For a comparison of the number and various types of licenses issued for the sale of imitation milk products, refer to Table 3.

Commercial Testing Service

All persons testing, sampling, weighing or measuring milk or cream when the tests or weights are used for determining payment of the products must be examined and licensed by the bureau. The work of all active licensees is checked at irregular intervals for accuracy. There were 361 checks and examinations conducted on milk and cream testers, and 2,707 on samplers and weighers. During the course of checking these licensees, 4,311 samples of milk and cream were collected for testing, and 48,325 pieces of testing apparatus were examined for accuracy; of these, 255 pieces were condemned as inaccurate. At the close of 1957, there were 796 licensed milk and cream testers and 2,002 licensed samplers and weighers. The number of such licensees, as well as other persons required to be licensed by the bureau, appears to be constant throughout the years.

Installation of bulk farm milk tanks on dairy farms still continues to increase. During the year, it was necessary to check and test 1,207 such tanks which now number 3,763 as compared to 3,550 a year ago. The records were checked at 386 milk products plants for the purpose of determining correctness of tests and weights, and 332 investigations were made on sampling of milk and cream.

Dairy Container Service

Persons dealing in the manufacture, processing and distribution of milk and milk products are authorized to register brands appearing on containers and equipment used for that purpose. During the year, 61 dairy container brands were registered, and at the close of 1957 there were 861 active certificates of dairy containers registrations. Most of the enforcement of the provisions of the

code relating to the use of registered dairy containers must of necessity be of a self-co-operating voluntary basis, and supported by trust fund agreements. There are four such agreements in existence covering the Northern California area, the San Francisco Bay area and the Sacramento-San Joaquin Valleys. The three investigators employed on this program made 7,172 visits to various establishments to check on the containers, and were instrumental in returning 11,718 to their rightful owners. They also checked the brands and conditions of 529,698 containers, and condemned 16,028 of them because of faulty conditions. The exchange and return of dairy containers is facilitated through the services of bottle exchanges organized and established throughout the State. Such exchanges are under the supervision of the department, which made 273 investigations on the operation of bottle exchanges.

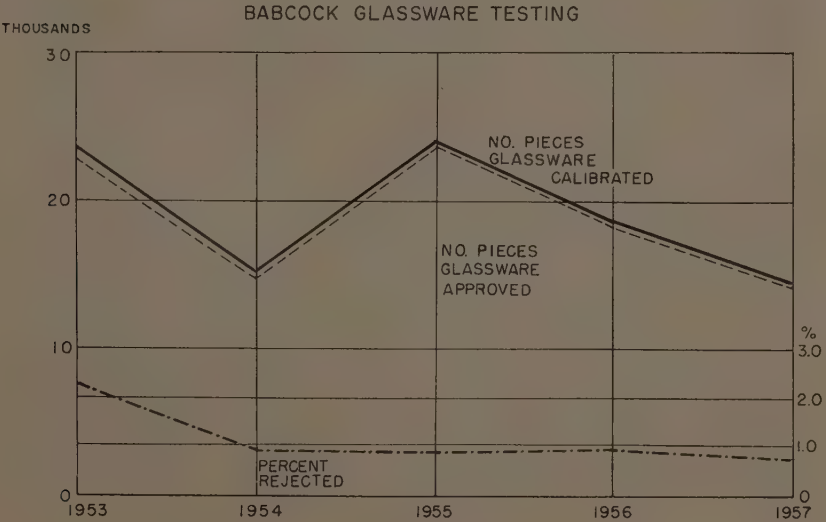
Representatives of the bureau associated with the manufacturing milk and cream quality control program are in a position to render service to the industry in recovering stray milk cans. This activity resulted in the return of 2,114 cans to the proper owners. They also examined 296,810 milk cans for defects; of these, 4,697 were defective, and were condemned. The washing

and sterilization of dairy containers is a process usually accomplished by mechanical devices. During the year, 3,259 inspections were made on such devices. Dairy products, being perishable, containers of dairy products must be transported in vehicles kept in a sanitary and clean condition at all times. This provision accounted for the 24,724 inspections of transportation facilities.

Dairy Service Laboratory

The main activity of the dairy service laboratory is the examination of milk and milk products by chemical and bacteriological procedures for the purpose of determining if such products conform to legal standards. During the year, 15,904 bacteriological and 12,282 chemical determinations were made on the 17,662 samples of milk and milk products tested in the laboratory. All glassware used in connection with various methods for testing milk and cream for its milk fat content before such glassware can be used in California must be examined by the laboratory. During the year 14,459 pieces of such glassware were examined, 14,347 pieces were approved. An indication of the number of pieces of glassware examined by the laboratory for the past five years will be found on Chart 1.

Chart 1



In addition to the examination of official samples, several hundred samples of milk and milk products were checked for flavor, odor, texture, color and quality. During the year some special work was done on the bacterial content of nonfat milk powders when the problem of determination was approached simultaneously with the standard plate count, the direct microscopic clump count, and the direct microscopic cell count.

Our dairy bacteriologist spent several weeks in the field checking such equipment and techniques of our field personnel engaged in "platform grading." In collaboration with the U. S. Public Health Service, the laboratory engaged in two split sampling programs with nine other health laboratories wherein actual samples of milk and cream were analyzed simultaneously for bacterial content by the standard plant count. Results were correlated by the laboratory, and the results disseminated to interested agencies.

General

Many activities of the bureau are general in character. For example: there were 4,385 visits made to retail establishments for checking the labeling and quality of products, and 15,556 inspections and visits were made to milk products plants. At these

plants 3,113 temperature recording devices were checked for accuracy, and 28,462 thermometer charts examined to see if all required information was shown. One thousand six hundred seventy-nine pasteurizer operators were checked for the accuracy of their work, and at the end of the year there was a total of 2,365 licenses issued to operators of pasteurizing equipment. The total of H. T. S. T. pasteurizing units checked during 1957 was 308. During the year, 626 new milk products plants and dairy farm buildings were constructed, and 1,321 buildings improved. Improvements secured on equipment amounted to 5,498 and on methods 12,191. A total of 844 chemical tests was made on washing and sterilizing solutions, 66 sterility tests made on equipment, and 1,638 on water supplies.

Members of the bureau continued to assist the Dairy Industry Division and the Division of Veterinary Science at the University of California, Davis, in instructing students in dairy science. They also assisted with the judging of milk and milk products entries at the California State Fair and at various district and county fairs. The bureau again took over the supervision and demonstration of the operation of the model dairy barn at the State Fair Grounds.

Training courses were held in various sections of the State for state, county and city milk inspectors and sanitarians.

Bureau of Livestock Disease Control

H. G. WIXOM, D.V.M., *Chief*

E. F. CHASTAIN, D.V.M., *Assistant Chief*

The Bureau of Livestock Disease Control enforces those parts of the Agricultural Code and regulations pertaining to the prevention, control and eradication of diseases of livestock and poultry, particularly Sections 30.6 and 34.7, Articles 1, 2, 2a, 2b, 3, and 3a, Chapter 3 and Chapter 4, Division 2.

The administration of livestock disease control measures is authorized in Sections 16 and 181 through 262 of the Agricultural Code. The regulations pertaining to these acts are listed under Title 3, Section 750, through 794.5 of the California Administrative Code.

The functions of this bureau are divided into four general categories.

General Livestock Disease Control

Practicing veterinarians are required to report promptly to the bureau those animal diseases specified by the department. When necessary, veterinarians of the bureau make investigations of animal diseases so that control and eradication procedures may be established, and when indicated, animal quarantines are applied, or surveys may be made.

Restrictions on all livestock imports, including vessel and aircraft garbage and food supplies, are enforced to protect the livestock industry of this State. The Bureau of Plant Quarantine co-operates in making inspections at highway inspection stations, international airports and major ports.

Inspections and certifications are made pertaining to interstate and intrastate movements of livestock, including the issuing or approving of official health certificates, and the issuing of permits.

Specified Animal Disease Eradication and Control Programs

Five official programs were conducted in co-operation with the Animal Disease Eradi-

cation Division, United States Department of Agriculture. These programs, requiring the services of federal, state, and contract practicing veterinarians, constituted the main workload of the bureau. These programs were bovine tuberculosis eradication, bovine brucellosis calf vaccination, bovine brucellosis control, vesicular exanthema eradication, and scrapie eradication.

Laboratory Diagnostic Services

Four general livestock and poultry diagnostic laboratories are operated by the bureau in Petaluma, Sacramento, Fresno, and San Gabriel. Two branch laboratories for diagnosis of poultry diseases are maintained at Turlock and Lancaster. Modern disease control requires prompt confirming laboratory diagnosis for suspected diseases. The laboratory services are used extensively by the poultry industry, as well as by state and practicing veterinarians.

Administrative Functions and Services

Services of 150 employees are required to maintain the expanding services of this bureau. Administrative headquarters are in Sacramento.

There are 10 district field offices, and the 6 laboratories mentioned previously. Personnel consists of 80 veterinarians, 7 livestock disease control inspectors, 21 technicians and other laboratory workers, and 36 clerical employees. In addition, there are 361 contract practicing veterinarians engaged in brucellosis control work, which includes calf vaccinations. The Los Angeles and San Diego County Livestock Inspection Departments assist in disease control programs in their counties. The University of California School of Veterinary Medicine, Davis, co-operates on current livestock and poultry disease problems requiring research and further study.

GENERAL LIVESTOCK DISEASE CONTROL PROGRAMS

Anthrax

During 1957, 12 anthrax outbreaks were reported, seven confirmed by laboratory findings. Six outbreaks occurred in Merced County, two in Butte and one each in Contra Costa, Lassen, Napa, and San Luis Obispo Counties. Forty deaths were reported in seven of these outbreaks.

Bluetongue Disease of Sheep

Fifty-two outbreaks of bluetongue were reported in 15 counties. Heaviest infection was in Imperial County, 11 outbreaks, and Solano County, 12. While the incidence of outbreaks in flocks reported was only one less than in 1956, the number of sheep infected and deaths were only about one-fourth the number in 1956, when 5,114 sheep were reported infected, resulting in 850 deaths.

Bluetongue Outbreaks Reported in 1957

County	Number inf. flocks	Approx. number in flocks	Number sheep infected	No. sheep dead
Amador	1	160	30	—
Calaveras	1	60	7	2
Colusa	2	2,600	11	5
Imperial	11	18,310	492	71
Merced	2	2,300	100	5
Placer	2	323	28	2
Riverside	2	1,100	301	81
Sacramento	2	750	31	8
San Bernardino	1	2,000	2	2
Solano	12	9,708	52	10
Stanislaus	1	120	—	—
Sutter	5	5,100	122	8
Tehama	2	2,750	45	12
Yolo	6	3,279	45	8
Yuba	2	3,000	220	10
Totals	52	51,560	1,487	224

Equine Encephalomyelitis

Sixteen clinical cases resulting in two deaths were reported during the year, compared with 36 affected and three deaths in 1956. Two thousand one hundred eight horses were vaccinated during 1957, as compared to 1,834 in 1956.

1957 Summary Report in the Incidence of Equine Encephalomyelitis Outbreaks

County	No. horses in infected herds	Number affected	Number dead
Fresno	8	3	—
Mendocino	1	1	—
Merced	1	1	—
Placer	5	1	1
Riverside	12	1	—
Sacramento	2	2	—
San Joaquin	1	1	—
Shasta	1	1	—
Stanislaus	1	1	—
Sutter	200	1	1
Tehama	17	2	—
Tulare	12	1	—
Totals	261	16	2

Chorioptic Scab (Leg Scab)

Chorioptic scab was reported in seven lots of cattle and one band of sheep. The cattle scab was found mainly in purebred cattle shown at livestock shows or county fairs. In each case, the exposed herd or flock was treated with benzene hexachloride (BHC) solution twice, 10 to 12 days apart.

Fever Tick Eradication

On June 19, 1957, the quarantine on the Marron Valley cattle in San Diego County was lifted. It had been imposed July 12, 1956. In July, 1956, Texas fever ticks were found in a lot of 60 head of cattle on the American side of the border fence dividing the valley. A total of 25 dippings was made at two-week intervals during this period. Shipments out of the valley were permitted only after two dippings had been completed, the last one being just prior to movement.

The border fence across the valley, in need of repair when the tick-infected cattle were found, has been rebuilt. The owner also constructed a parallel fence, ranging from 11 to 200 feet inside the border fence.

These measures should prevent further re-infestation of the Marron Valley ranch by tick-infested cattle from the Mexican side of the border. The Animal Inspection and Quarantine Division, United States Department of Agriculture, has repaired and reconstructed approximately 10 miles of border fence. Although the condition of the border fence is much improved, constant surveillance is necessary. Six inspectors and one supervisor are assigned by the Animal Inspection and Quarantine Division to conduct the border surveillance work.

Infectious Bovine Rhinotracheitis

During 1957, infectious bovine rhinotracheitis, IBR, an acute upper respiratory disease, occurred mainly in feed lot cattle and dairy herds in the southern half of the State. Reports for 1957 show a decided decrease in IBR cases from the previous year. IBR vaccines were used by several large feed lot operators as a preventive measure, with favorable results. Secondary infections are the main cause of mortality in affected animals.

1957 Summary Report of the Incidence of Rhinotracheitis

County	Infected lots	Number of cattle	Number affected	No. dead
Fresno	1	3,500	100	—
Imperial	7	10,430	80	9
Los Angeles	1	1,500	12	—
Riverside	1	1,000	1	—
San Bernardino	3	541	60	1
San Diego	3	900	15	4
San Francisco	1	39	—	—
San Mateo	1	57	10	3
Tulare	1	250	20	—
Totals	19	18,217	298	17

Johne's Disease

Only two reports on Johne's disease were received in 1957. These came from Stanislaus and Sonoma Counties.

Leptospirosis

Leptospirosis continues to be a major disease, particularly in the concentrated cattle sections of Central California. Good results

from vaccinations are reported in controlling spread of the disease in infected areas. Vaccination is now a common procedure in herds following acute outbreaks on infected premises.

1957 Leptospirosis Outbreaks

	North	Central	South
Cattle	111	234	33
Horses	1	6	4
Swine	2	11	2
Sheep	—	—	—

Scabies

No cases of psoroptic or sarcoptic scab were reported in the State in 1957. Cattle scabies remains a constant threat, due to frequent shipments from southeastern Colorado, an infected area. Cattle Scabies Regulation 757, adopted February 1, 1955, restricts the movement of cattle from 10 Colorado counties. On December 5, 1957, the scabies regulation was amended by adding the State of Kansas. Psoroptic scab was diagnosed in Seward County, Kansas, during November.

Sheep Scabies Regulation 760, amended April 8, 1957, added 10 states, including one western state, Wyoming, and deleted one from the infected areas. On October 4, 1957, Wyoming was deleted from the regulation, as it was believed that scabies had been eradicated in that state.

Artificial Insemination

In 1957 there were seven organized artificial insemination associations. They employed 216 inseminators who inseminated approximately 290,000 dairy cows. Also in 1957 there were 35 independent inseminators who inseminated approximately 9,000 cows. There were approximately 33,000 more cows inseminated in 1957 than in 1956. No data were received on artificial insemination services in other animals.

Slightly over 32 percent of the State's dairy cows two years old and over are now being bred artificially. The national average is 25 percent in approximately 23,213,000 dairy cows.

TUBERCULOSIS ERADICATION PROGRAM

H. H. PAGE, D.V.M.

The Bureau of Livestock Disease Control and the Animal Disease Eradication Division of the United States Department of Agriculture continued joint bovine tubercu-

losis eradication program. Under the cooperative effort of these regulatory organizations, tuberculin tests were conducted on 15,849 herds. Cattle tested totaled 726,658,

with 1,949 reactors being found. This is a reactor rate of 0.27 percent. All reactors were slaughtered under official meat inspection.

Los Angeles County livestock inspectors made 61,182 additional tests, which revealed 87 reactors.

Practicing veterinarians made tuberculin tests on 13,394 cattle. Nine reactors were found.

Area testing by regulatory personnel resulted in the declaration of 23 counties as modified accredited tuberculosis-free areas. Twenty counties: Alpine, Butte, Kern, Los Angeles, Madera, Marin, Monterey, Nevada, Plumas, Sacramento, San Benito, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Sierra, Solano, Sutter, Trinity and Tulare, were remodified for three years. Three counties, Calaveras, Mendocino and Tehama, were remodified for six years.

The six-year accreditation period for 19 counties was adopted this year. These coun-

ties are range and semirange areas in which the incidence of tuberculosis is extremely low or does not exist. Dairy herds, purebred herds, and family cows will be tested bi-annually. The 19 counties, including Calaveras, Mendocino and Tehama, to be accredited on a six-year basis at the next remodification date are: Alpine, Amador, Calaveras, El Dorado, Inyo, Lake, Lassen, Mariposa, Mendocino, Modoc, Mono, Plumas, San Benito, Shasta, Sierra, Siskiyou, Tehama, Trinity and Tuolumne.

Measures taken to assist the tuberculosis eradication program included the annual testing of clean herds showing a history of prior infection and herds in which all replacements are purchased, the use of the cervical test in infected herds, and increased emphasis placed on accurate post mortem reports and laboratory examinations.

Regulatory veterinarians made tuberculin tests on 623 goats. Private veterinarians made five; no reactors were found.

VESICULAR EXANTHEMA CONTROL PROGRAM

L. D. MEYERS, D.V.M.

The vesicular exanthema (VE) control program is administered under the Swine Diseases From Garbage Law in Sections 216 through 216.10 of the Agricultural Code, and Sections 793 through 794.5 of the California Administrative Code. There have been no outbreaks of VE in California since November, 1955. No outbreaks have occurred in the United States during the year.

An average of 339 licensed operators fed sterilized garbage to hogs in California during 1957, averaging 215,491 head monthly. Thirty-five of the premises operated by state or local governments were exempted from the required application fee.

Regular health and cooking inspections, maintained on all licensed premises, averaged 1,236 monthly. In the metropolitan areas, where VE had been endemic for years, weekly inspections of premises continued. In remote areas, a minimum of one or more inspections per month, as far as

practical, was made by federal, state, or county inspectors.

There was a decline of 57 licensed premises, representing 10,000 hogs, during the year. The total dropped from 373 on December 31, 1956, to 316 on December 31, 1957. Eighty-one hold orders were issued during the year to owners who were feeding raw or improperly cooked garbage. Ten persons fed cooked garbage without a license. Most of these offenders were small, seasonal operators who ceased garbage feeding when discovered, or obtained a license.

In the court trials, all offenders were found guilty as charged. One was fined \$500, suspended for a three-year probation period; another was fined \$100, and the third was fined \$50. Seven offenders were cited into the district attorney's office, and warned that future violations would subject them to court action. Activities of small operators remain the main enforcement problem.

SCRAPIE ERADICATION

GORDON SCHULTZ, D.V.M.

Scrapie appeared in three flocks of sheep in California in 1957. The first outbreak occurred in a flock of 1,332 purebred Suffolk sheep near Dixon, Solano County. The

disease was apparently introduced into the flock by a purebred Suffolk ram imported from England. This ram arrived in the flock on February 1, 1954, and was showing symp-

toms of the disease on February 20, 1957. Sales from this flock since February 1, 1954, involved 222 owners and 2,082 sheep in California, and 320 sheep in 12 other states.

The second outbreak occurred on March 21, 1957, in a commercial flock of 2,849 sheep near Lincoln, Placer County. An infected ram had been imported from a purebred flock in Amity, Oregon, during 1954. During 1955, an outbreak near Thornton, San Joaquin County, was also traced to the Oregon flock.

These two outbreaks in California, coupled with another outbreak, and possibly a fourth, in Oregon in 1954, traced to the same flock, caused the federal and Oregon officials to declare the Amity sheep to be infected with scrapie. The Oregon flock was destroyed. Sheep sold from this flock subsequent to October 1, 1953, were considered exposed. Sales in California from this flock involved 650 sheep and 57 flocks.

While bureau veterinarians were checking a flock at Maxwell, Colusa County, on May 1, 1957, and at Chico, Butte County, on the same date, for sheep from the Amity, Oregon, flock, the third outbreak for the year was found. This was in a commercial flock of 7,088 sheep.

In each outbreak, diagnosis of scrapie was confirmed by the department's Sacramento Livestock and Poultry Pathology Laboratory and by a United States Department of Agriculture Laboratory, Beltsville, Maryland.

All sheep in the affected flocks were appraised and slaughtered under inspection, destroyed on the ranch and buried or sent to a reduction works. Officials of states into which exposed animals had been shipped were notified. All animals from infected flocks and their progeny sold for breeding purposes within 42 months prior to the diagnosis of scrapie were appraised and destroyed in the same manner as sheep in infected flocks. The flocks into which these animals were introduced, received and will continue to receive semiannual inspections for 42 months subsequent to the diagnosis of scrapie. There were 266 flocks involving 195,962 sheep in this classification. All were placed under surveillance.

Premises involved were cleaned and disinfected. Those premises where the infected flocks were maintained were kept free of sheep for three months.

There were 14,166 sheep, from 294 flocks, destroyed under the scrapie eradication program in 1957. Appraised value for those sheep destroyed was \$521,534.19. California's indemnity amounted to \$215,269.07.

The United States Department of Agriculture shared in the eradication program, and also in the indemnity paid on sheep destroyed. All claims were paid on infected and exposed animals by December 31, 1957, except one for 219 rams. California's share of this claim is \$8,231.33.

BOVINE BRUCELLOSIS CONTROL PROGRAM

E. F. CHASTAIN, D.V.M.

Calfhood Vaccination

Notwithstanding the establishment of the new brucellosis testing program, the vaccination of calves against brucellosis remained an extremely important part of the control program. During the year, 384,444 calves were vaccinated, almost 10 percent more than in the preceding year. The increase was in calves of beef breeds which totaled 147,595 head. There were 236,849 dairy calves vaccinated in 1957. During the 10-year period of the calf vaccination program, 3,143,261 animals in 242,950 herds were vaccinated.

Progress of testing in brucellosis control counties as of December 31, 1957, revealed the following results:

Herds tested	2,144
Herds with infection	344
Total cattle tested	120,983
Total cattle reacting	1,090
Total cattle in herds tested	207,741

Federal Interstate Brucellosis Regulation

On January 1, 1957, a federal interstate regulation became effective. This regulation, in various ways, affected the movement of practically all classes of cattle across state lines. The regulation was designed to protect the gains made by cattle owners in certain areas by their brucellosis testing programs.

Segregation of Feeder Cattle Moved Interstate Regulation

The movement of large numbers of feeder heifers and bulls into California was restricted by the federal regulation, and it became necessary to find a way to handle these cattle within the State. As a result, Section 754.6 of the California Administrative Code, Segregation of Feeder Cattle Moved Interstate, was adopted as an emergency measure on January 23d, to give relief to the cattle feeding industry. This regulation provided that heifers and bulls could enter the State for feeding and grazing purposes under permit, and subject to segregation and hold order at destination. The regulation was amended on May 26th to provide for the designation of certain feed yards to operate under permanent hold order for the purpose of handling interstate cattle. Fifty-seven feed yards were so designated as the year closed.

Brucellosis Area Certification

Since range cattle of many areas in California are regularly moved interstate for seasonal grazing, the Federal Interstate Brucellosis Regulation could cause considerable hardship unless provisions were made to work toward the establishment of modified certified brucellosis-free areas. To provide this relief, hearings were held in Los Angeles on February 5th, and in Sacramento on February 7th, on proposed adoption of a brucellosis area certification regulation. As a result of the hearings, Section 754.4 of the California Administrative Code, the Brucellosis Area Certification Regulation, was adopted and filed with the Secretary of State on March 4th, to become effective April 3d.

Also considered at the Los Angeles and Sacramento hearings, and adopted along with Section 754.4, was Section 754.5 of the Administrative Code, Reactors to the Milk Test. This regulation provided that reactors to a milk whey test should be handled in the same manner as animals reacting to a blood test.

California now had a regulation which provided that, when presented a petition of 65 percent or more of the cattle owners representing a majority of the cattle in any county, the Director of Agriculture may declare such a county a brucellosis control area. After receipt of the required petitions from Alpine, Del Norte, Marin, and Mono Counties, Section 754.4 of the Administrative Code was amended by the director on April 9th, establishing those counties as the first

brucellosis control areas in the State. The section was amended again on May 6th by adding Inyo County to the brucellosis control areas after receipt of a qualified petition from the livestock owners of that county.

By the arrival of summer, testing of cattle in the five control area counties was in progress on a limited scale. Since no funds were provided in the State Budget for brucellosis testing, the cost of collecting blood samples and the payment of indemnity to owners of reacting cattle was borne by the Federal Government. Indemnity was based on one-third of the difference between the appraisal and the salvage value of a reacting animal, not to exceed \$25 for grade animals or \$50 for purebred animals. The fee paid to practicing veterinarians for collecting blood samples was \$2 per stop, plus 50 cents for each animal tested.

Livestock interests in the State foresaw the expansion of the brucellosis testing program eventually to include all counties. Appeals were made to the State Legislature to enact certain legislation which would strengthen the Brucellosis Law, provide money to assist in carrying out the program, and to indemnify owners of reacting cattle. Assembly Bills Nos. 1503 and 1903 were passed by the Legislature, approved by Governor Knight on July 10, 1957, and filed with the Secretary of State on July 15 and 16, 1957.

The new laws, effective September 11th, established a sound foundation for an eradication program, and gave the director specific authority for their implementation by regulation. Therefore it became necessary to make changes in existing brucellosis regulations, and to adopt several new ones. Hearings were held in Redding on September 13th, and in Sacramento on September 17th, to consider these changes. No opposition was expressed at the hearings. The changes became effective on September 23d.

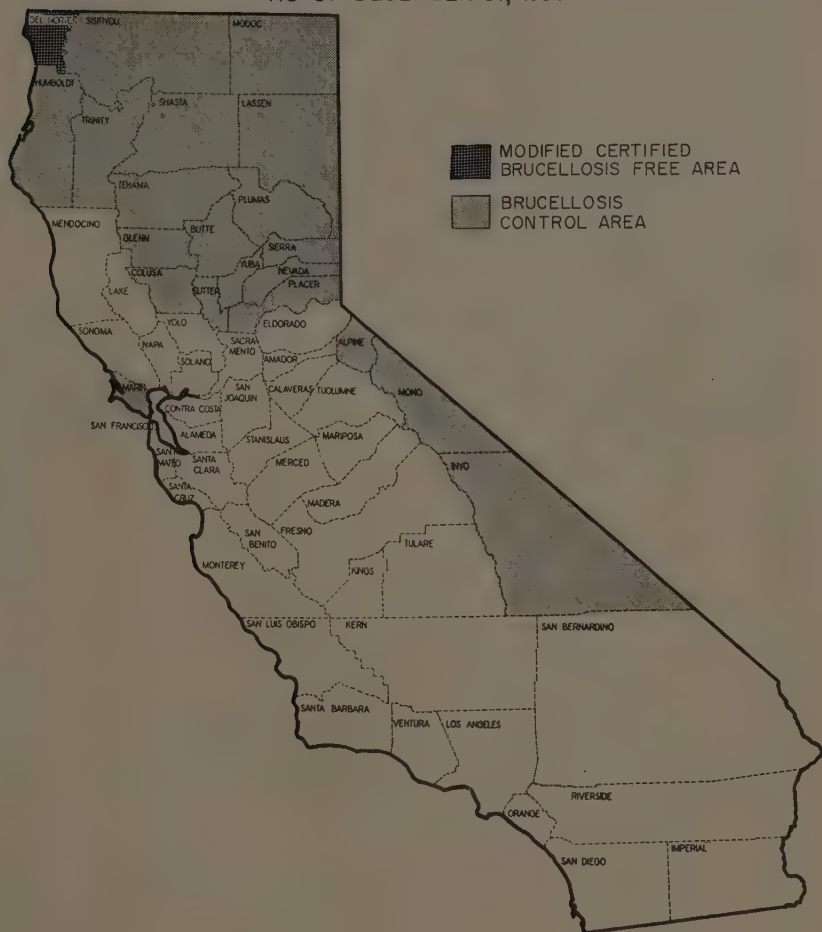
The most important changes made in the Administrative Code were as follows:

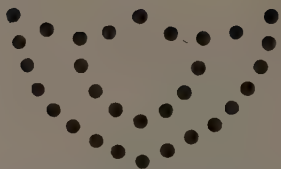
Amendments to Brucellosis Control Laws

Section 752, Bovine Brucellosis Official Tattoo, was amended by adopting the official United States Department of Agriculture Shield Insigne in place of the C with a superimposed V previously used.

Section 753, Age of Calves to be Vaccinated, was amended by lowering to four months the minimum age at which calves could be officially vaccinated against brucellosis.

BRUCELLOSIS CONTROL AREAS
AND MODIFIED CERTIFIED BRUCELLOSIS FREE AREAS
AS OF DECEMBER 31, 1957





New tattoo design used to identify cattle vaccinated under the calfhood vaccination program

Section 754 was amended by approving a chemical brand to identify reactors, and by providing that adult vaccinated cattle, or officially calfhood vaccinated cattle over 30 months of age reacting positively to a brucellosis test will be branded and handled as brucellosis reactors.

Section 754.1 was amended to exempt cattle not under quarantine in a modified certified brucellosis-free area from the intrastate movement restrictions of the regulation.

Section 754.2 was repealed, since it was considered that the Federal Interstate Bru-

cellosis Regulation adequately controlled the movement of cattle into the State.

Section 754.4 was amended by substituting public hearings for the petition previously required to establish a brucellosis control area, and by redeclaring the Counties of Alpine, Del Norte, Inyo, Marin and Mono as brucellosis control areas, and adding the Counties of Butte, Humboldt, Lassen, Modoc, Plumas, Shasta, Sierra, Siskiyou, Tehama and Trinity as brucellosis control areas.

Section 754.5 was amended to define the approved brucellosis tests.

With substantial new laws enacted and up-to-date regulations adopted, the testing program gathered speed. Two United States Department of Agriculture mobile laboratories were operated in the range cattle areas in Siskiyou and Modoc Counties. An auxiliary blood testing laboratory was opened in the Lassen County milk testing laboratory. Through an appropriation of \$68,249, the State shared some of the expense of conducting the program. The State

Modified Certified Area Certificate

COOPERATIVE BRUCELLOSIS ERADICATION

UNITED STATES DEPARTMENT OF AGRICULTURE

Agricultural Research Service

Cooperating with the State of

California

This is to certify that Del Norte County has been declared Modified Certified Brucellosis-Free by virtue of the fact that Brucellosis has been reduced to not more than one percent of the cattle in not to exceed five percent of the herds as indicated by official testing and other approved procedures conducted under the cooperative State-Federal program.

This certificate is valid for the period of three years

Nov. 12, 1957 to Nov. 12, 1960

W. B. Jacobson
State Official
C. E. Anderson
Federal Veterinarian

Samuel D. Anderson
Director
Animal Disease Eradication Division
Agricultural Research Service

Certificate issued to Del Norte County when it was declared a modified certified brucellosis-free area. This is the first county in California to reach this status.



Officials who participated in the December 2, 1957, ceremony in honor of the certification of Del Norte County: Reading left to right: FIRST ROW—K. L. Svane, Specialist in Milk and Milk Products, Bureau of Dairy Service, Eureka; A. J. Bianchi, Chairman, Dairy Department, California Farm Bureau Federation, Point Reyes; Dr. J. L. Hourrigan, Chief, Special Disease Section, Animal Disease Eradication Division, A.R.S., U.S.D.A., Washington, D. C.; Dr. C. L. Gooding, Veterinarian-in-Charge, Animal Disease Eradication Division, A.R.S., U.S.D.A., Sacramento; F. D. Haight, Chairman, Del Norte County Board of Supervisors; Dr. H. G. Wixom, Chief, Bureau of Livestock Disease Control, Division of Animal Industry, State Department of Agriculture, Sacramento; Dr. M. Lunstra, District Veterinarian, Bureau of Livestock Disease Control, Division of Animal Industry, State Department of Agriculture, Eureka; Dr. K. G. Cramton, Veterinary Livestock Inspector, Animal Disease Eradication Division, U.S.D.A., Eureka.

SECOND ROW—W. D. Pine, Farm Advisor, Humboldt County; Dr. J. E. Stuart, Chief, Division of Animal Industry, State Department of Agriculture, Sacramento; W. C. Jacobsen, Director, California Department of Agriculture, Sacramento; Maris Ward, President, Del Norte County Chamber of Commerce, Crescent City; Dr. K. G. McKay, Extension Veterinarian, University of California, Davis; Dr. S. A. Fuller, Humboldt County Veterinarian, Arcata; A. Pedrazzini, Statewide Brucellosis Committee member, Loleta; Elmer Dent, Farm Advisor, Crescent City.

also shared in the payment of indemnities from \$320,000 appropriated by the Legislature for that purpose. State indemnity was based upon one-third of the difference between the appraisal and the salvage value of the reactor, with a maximum of \$50 for grade animals and \$75 for purebred animals.

Interest in the new brucellosis control program was manifest by requests from the livestock industry that additional counties be included. On November 7th, the Brucellosis Area Certification Regulation was amended by adding Nevada, Sutter and Yuba Counties as brucellosis control areas, and on December 13th it was again amended by adding Colusa, Glenn, and Placer Counties, making a total of 21 control area counties at the close of the year.

First Modified Certified Brucellosis-Free Area Established

Del Norte County had the distinctive honor of being the first county in the State to become a modified certified brucellosis-free area on November 12th. This meant the infection rate had been reduced by official testing to 1 percent or less of the cattle population and 5 percent or less of the herds. Ceremonies marking the event were held at Crescent City on December 2, 1957. A certificate was presented to the board of supervisors.

Milk Whey Test Pilot Project

Because of the great interest of the dairy industry in the possible future approval and use of the milk whey test for brucellosis, it

was decided to set up a pilot program using this test. Following the approval of the Animal Disease Eradication Division, United States Department of Agriculture, to use the whey test in Marin County, a project was set up to be supervised by Dr. H. S. Cameron of the School of Veterinary Medicine, University of California. The program called for the use of the milk whey test on individual lactating cows in milk ring test (BRT) suspected herds. Dry cows in these herds and reactors to the milk whey test were blood tested. It was hoped to demonstrate that bovine brucellosis could be eradicated on an area basis by the use of the milk whey test, and consequently to gain official approval for its use in official control programs.

By agreement between the Federal Government and the State of California, the pilot program using the whey test was extended to 15 herds in Humboldt County.

Information gained from the pilot program was compiled and evaluated by Dr. Cameron in his efforts to obtain official approval of the whey test. As of the end of

the year, the project was about one-half completed. After studying a progress report, the Brucellosis Committee of the United States Livestock Sanitary Association felt that more information was needed before the milk whey test could be approved.

Adult Vaccination Regulation Repealed

On January 1, 1957, Section 754.3 of the Administrative Code, Adult Vaccination, was repealed as a result of a public hearing held on November 8, 1956. Cattle officially vaccinated as adult animals under the provision of this section prior to January 1, 1957, retain their officially vaccinated status until July 1, 1958.

Swine Brucellosis Control

The certified brucellosis-free swine herd program continued on a voluntary basis. At the end of the year, 21 owners were participating. Of these, 14 held brucellosis-free certificates. Swine brucellosis tests were conducted on 200 lots during the year. A total of 1,102 animals tested revealed seven reactors.

ORNITHOSIS

D. E. STOVER, D.V.M.

Ornithosis was diagnosed in two meat-producing pigeon flocks during the year. The first was found during January in a flock of 3,000 pigeons near Castro Valley in Alameda County. The infection was located by the State Department of Public Health in its investigation to find the source of a human case of psittacosis. No visibly affected birds were observed on the ranch, but specimens taken from squabs revealed the virus.

The second outbreak was diagnosed during May in a flock of 500 pigeons in Napa

County. The owner had death losses in his flock and submitted a few squabs for examination by the Petaluma laboratory. Virus isolations in both cases were made by the George Williams Hooper Foundation. Each flock underwent an intensive antibiotic treatment after which lots of pigeons were examined for the ornithosis virus. When repeated attempts to isolate the virus failed, and the flocks appeared to be generally healthy on inspection, it was considered that the disease had subsided.

LIVESTOCK AND POULTRY PATHOLOGY LABORATORIES

W. W. WORCESTER, D.V.M.

The Sacramento laboratory became involved with a number of sheep submitted for observation, necropsy, and confirmation by histopathological examination for scrapie. The findings, vacuolation of the neurons, proved positive in four animals.

A pleuropneumonia-like organism (PPLO) was isolated from the tissues, joints, spleen and kidney, of two goats submitted to the laboratory. The sera were agglutinated by a specific antigen, and characteristic colonial growth was observed on special PPLO media. The main signs were weakness, lameness and inability to stand.

Leptospirosis, vibriosis, white muscle disease and the pneumonia-enteritis complex seemed to prevail with respect to difficulties in fetal and newborn animals; whereas, anaplasmosis, leptospirosis and the clostridial diseases caused the greatest difficulty in older animals. *Corynebacterium* sp. have been involved in a number of erysipelas suspect conditions in swine and sheep.

With the start of the Brucellosis Control Testing Program during the latter part of the year, the numbers of tests increased greatly. Approximately 25,000 tests for brucellosis were conducted during

the final quarter of the year as compared to 13,000 the previous year.

Infectious hepatitis-synovitis was an important disease in both chickens and turkeys. In an outbreak of infectious hepatitis-synovitis in turkeys, due to PPLO, "tame" blackbirds found on the premises were checked, and the same PPLO was found to be present.

A marked increase in the incidence of crop moniliasis was noted. The majority of cases were presented to the laboratory with a characteristic history of the birds having received extensive "broad spectrum" antibiotics prior to onset of the crop trouble.

A marked increase in incidence of adult rickets (osteomalacia, "caged layer fatigue," etc.) was observed in chickens. These cases originated exclusively from caged flocks. Most of these cases have been resolved through cooperative efforts of feed field representatives, nutrition specialists and other workers.

Salmonella schwarzengrund was isolated from a low incidence case of marked nodular splenitis in a flock of adult turkeys.

The Petaluma laboratory encountered a notable increase in diagnoses of capillaria infestation and Newcastle disease and two diagnoses of Listeriosis in chickens. A skin mite of chickens, a *Rivoltasia* sp., not formerly known to exist in this area, was found.

Case work in large animal diseases increased only moderately for the year, but considerably during the last two months, as compared to 1956. In cattle there were notable increases in diagnoses of coccidiosis, trichostrongylosis, Johne's disease, leptospirosis, vibriosis and poisonings. One instance of prussic acid poisoning occurred due to a plant of the rush family; *Juncus* sp. Previously this species was not generally considered in California as dangerous cyanogenic plants.

The area certification program in Marin and Humboldt Counties initiated the use of the Brucella ring test and the Brucella whey test, and greatly increased brucellosis serological work in the laboratory. About three times as many leptospirosis agglutination tests were requested in 1957 as compared to 1956.

The Fresno laboratory observed a catarrhal enteritis in poults similar to the enteritis observed in Minnesota and described by Pomeroy. It was the significant poultry disease during the 1957 brooding season. The mortality, 10 to 35 percent, especially in the second and third broods, could not be controlled with the tetracycline drugs. The infectious hepatitis-synovitis syndrome has become one of the major disease problems in both turkeys and chickens in the area.

Sinusitis-air sac infection was observed in a number of flocks of geese during 1957. It was characterized by acute onset with heavy mortality.

The outbreaks in goslings occurred between five and eight weeks of age and were associated with breeder flocks that had a history of this disease.

Abortions, salmonellosis, leptospirosis and clostridial infections in cattle are again the principal disease problems of this area. A hemolytic mucoid, *E. coli*, has been isolated consistently from calves which demonstrated a disease syndrome similar to salmonellosis. This disease, colibacillosis, has been described for many years but it is included in this report because in some dairy herds it is of major economic importance and warrants further consideration as a disease threat.

Salmonella dublin continues to be one of the major calf diseases. This organism has been recovered from an aborted fetus and was considered to be the primary causative agent. *Salmonella dublin* was also isolated from a pustular dermatitis on the arm of a local veterinarian. This infection occurred following the removal of a retained placenta.

Erysipelothrix rhusiopathiae and *Corynebacterium pseudotuberculosis* were isolated from the joint fluid of lambs exhibiting symptoms similar to the avitaminosis E syndrome. These organisms were recovered in pure culture singly and in combination from different joints.

The San Gabriel laboratory reports that poultry disease control has shown improvement in the Southern California area. A special study has been made of bacteria commonly associated with coryza in chickens of this area. It was found that many more isolations were made of *Pasteurella* sp. and *H. gallinarum* when the cultures were incubated under reduced oxygen tension, by means of a simple candle jar. It was also found that media enriched with rabbit blood gave better growth than with chicken blood.

The number of specimens from horses submitted by practicing veterinarians increased greatly this year. Abortions were of most concern. Agglutination tests for leptospirosis were made on 56 serum samples, 18 of which were positive. Most of the sera were from mares on ranches where there was an abortion problem. Diagnoses of abortions caused by leptospirosis were made on four ranches, by demonstrating the organisms in aborted fetuses, or by a rise in agglutination titers of dams' serums. A report on one case was published in the *Journal A. V. M. A.*, December 15, 1957.

This was the first year since the founding of the Turlock laboratory that the number of chicken cases failed to increase over the previous year.

The disease picture has not changed much over the previous year. The only noteworthy change in the disease picture was a severe type of enteritis first encountered in the early spring of 1957 in turkeys. We called this Minnesota-type enteritis as it seemed to fit the signs described by Pomeroy in Minnesota. These cases ordinarily did not respond to the broad spectrum antibiotics.

1957 Summary of Laboratory Accessions and Serological Tests

Laboratory	Poultry accessions	Pullorum tests	S. Typhimurium tests	Animal accessions	Brucellosis tests	Leptospirosis tests
Sacramento	1,321	256,260	201,050	492	31,233	1,032
Petaluma	1,812	—	—	388	20,838	1,274
Fresno	2,046	491,777	113,562	1,174	13,640	2,239
San Gabriel	3,277	182,408	48,077	301	9,796	760
Turlock	4,511	—	—	—	—	—
Lancaster	766	—	—	—	—	—
Totals	13,733	930,445	362,689	2,355	75,507	5,305

The Lancaster laboratory has experienced better poultry management practices. The full-time services of a practicing poultry veterinarian in the area are showing an improvement in the disease situation. The primary disease problems in chickens are still in the respiratory infections. As in past years, these infections, whenever they are very serious, occur as combined infections or as "respiratory complexes."

In the group of respiratory diseases we have observed a peculiar type of conjunctivitis, characterized by a thickening and swelling of the eyelids so that the eye opening becomes almond shaped. This condition has been observed particularly in fryers from three to nine weeks old. It is often ac-

companied by a sharp hacking cough (similar to the so-called C. R. D. cough). It has usually been seen in from 3 to 10 percent of the flock. We have frequently observed "vaccination breaks" following laryngotracheitis vaccination in flocks affected with this peculiar conjunctivitis and cough.

Infectious hepatitis-synovitis has been on the increase in the area. However, very few acute outbreaks were encountered.

A new microslide smear technique for laboratory diagnosis of laryngotracheitis has been developed at this laboratory, resulting in a saving of time and the expense of test birds. It is planned to present this technique in one of the veterinary journals.

Bureau of Livestock Identification

LOGAN MORTON, *Chief*

PAUL G. ROBERTSON, *Assistant Chief*

The Bureau of Livestock Identification is a service function of the State Government which is supported entirely by the livestock industry of California.

The primary responsibility of the bureau is to protect the industry from loss by theft or straying of livestock. In order to provide this protection, the bureau performs several functions which fall within the provisions of Division 3, Chapters 2, 4-8 of the Agricultural Code of California.

Administration

The work of the bureau is directed by the chief, aided by the assistant chief. There is an office staff of brand, estray, license, and account clerks and secretaries. The bureau is advised in its activities by the Livestock Industry Advisory Board which is appointed by the Director of Agriculture and consists of five members, two from the beef industry, two from the dairy industry, and one from the marketing branch of the livestock industry. The advisory board meets at least quarterly to consider current problems relating to brand registration, brand inspection, slaughter, salesyard and horse transportation licensing, and the handling of estray animals.

During 1957, a change was made in the field operations of the bureau to provide closer supervision of field personnel and provide a more efficient service to the in-

dustry. Two additional area supervisors were appointed pursuant to the reorganization plan adopted the year before. The State is now served by three area supervisors, eight supervising brand inspectors, 75 full-time and 25 part-time brand inspectors located where they can best serve the needs of cattlemen in the State.

On July 26, 1957, a public hearing was held for the purpose of considering the advisability of repealing the administrative regulation requiring burned imprints of cattle brands. As a result of the evidence presented at this hearing, this regulation was repealed effective September 5, 1957. Burned imprints therefore have not been required since the effective date of the repeal of the regulation.

Brands and Brand Records

Any design which is permanently impressed on the hide of cattle, horses, mules, burros, and sheep by burning with acid, a chemical compound, or a hot iron is considered a brand within the meaning of the law and must be recorded with this bureau before use. Brands for swine may also be recorded, but it is not mandatory.

Persons wishing to record a brand must file an application showing the desired design and location. Upon receipt of the application and \$2 registration fee, a search is made to ascertain whether the design re-

quested conflicts with any brand design already recorded. If there is no conflict, the brand is recorded. If a similar brand is recorded, the applicant is notified and the bureau suggests several variations of the basic design which may be recorded. Earmarks may be recorded with the brand, but not alone. The fee for registration is \$2 which entitles the brand holder to its use until the end of the calendar year in which it was registered. Advance fees may be paid up to a period of 10 years. Applicants who fail to submit all required documents and fees within 90 days forfeit the application fee, and shall not be entitled to a recordation until such time as a new application and fee are received.

Each year, during October and November, a renewal notice is sent to each brand holder of record, unless he has paid renewal fees in advance. The renewal fee is \$2 for each calendar year. Brands that are not renewed before the end of a 30-day grace period are suspended. The brands may be reinstated any time within the calendar year upon the payment of a reinstatement fee of \$4. If the brand is not reinstated by December 31st of the year in which it became suspended, it is forfeited and is available for registration to anyone who may apply.

At the beginning of 1957, there were approximately 29,000 brands of record. New registrations during the year totaled 2,209.

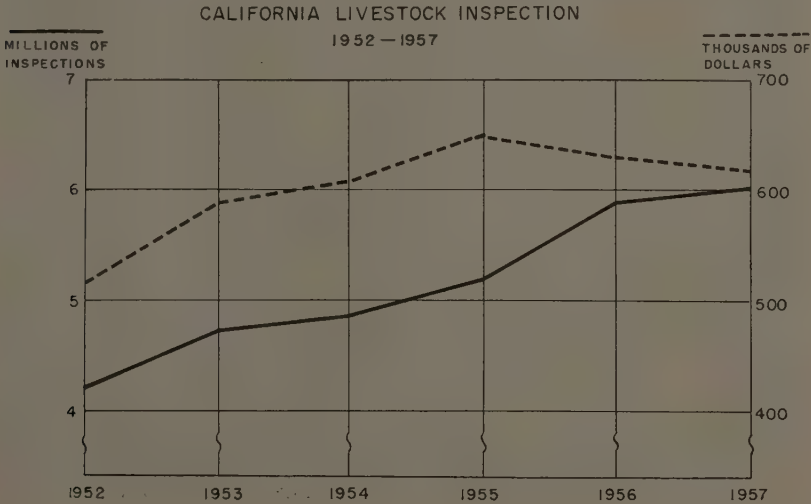
Brands may be transferred from one person to another by the filing of the proper forms and a \$2 transfer fee. In cases where the registered owner is deceased and the executor of the estate has not been discharged by the court, the transfer form may be signed by the executor. If the brand is registered to a partnership, any one of the remaining partners may sign the transfer form. If, however, the estate has been closed and the executor discharged, it becomes necessary for a certified copy of the decree of distribution of the decedent's personal property to be filed with the bureau. Where the estate is not large enough to be probated, a statement of heirs will be accepted as authority for transfer of the decedent's brand to his heirs. Under no circumstance may a brand be legally used on cattle other than those belonging to the registered owner or to his estate while it is in the process of liquidation.

Brand Book Supplement

During 1957, a new brand book supplement was published covering new registrations, reinstatements, and transfers from June 1, 1955, to June 1, 1957.

Brand Status

In 1917, when brands were first recorded with the State, they were recorded on a district basis. It was then possible to record identical brands in different districts. As the



industry grew and transportation facilities made the movement of cattle easier, these identical brands presented a problem, since cattle bearing similar brands were sometimes found in adjacent fields. In 1947, the California Legislature enacted a law requiring all brands to be placed on a statewide basis before January 1, 1959. Where two or more registered brands are similar, only the one bearing the lowest registration number will remain active. The others will have to be canceled.

Brand Inspection

All cattle being transported out of an area having full point-of-origin inspection, out of the State of California, across an established cattle movement zone line, or by or to a new purchaser are required to be inspected. Cattle are also required to be inspected prior to slaughter, prior to release from a public stockyard, public salesyard, or public or private cattle sales market, and prior to release from a posted stockyard or

posted salesyard. Horses are only inspected at slaughter plants prior to slaughter.

Point-of-origin areas are those in which 65 percent of the cattle owners present and voting at a public hearing request inspection prior to the movement of any cattle from the area. Cattle which are moving from pasture to pasture, which do not cross a zone line and where no sale is involved, require no inspection.

Regular inspection is maintained at all cattle salesyards, posted stockyards, and slaughterhouses. Hides are also inspected at tallow works and hide companies. Operators of some slaughterhouses, located in remote areas where daily inspection is not warranted, are required to send monthly reports of animals killed to the bureau, and the hides of such animals are retained for periodic inspection.

During the year 1957, there were 6,008,956 animals inspected by the field force of this bureau. This total compares with 5,869,787 for the previous year.



The prevention of cattle theft and apprehension of cattle rustlers are among the brand inspectors' duties. This Hereford was shot by cattle thieves who fled the scene of their crime before they could load the animal in their vehicle.



Sometimes the brand inspector and co-operating law enforcement agencies have very few clues with which to solve a case. The footprint (above) and tire print (below) were the only clues left by the rustlers who shot the steer pictured on the opposite page.



Slaughterhouses

Any person engaged in the business of slaughtering cattle or horses within this State must first procure a license and execute a bond to cover the operation of each slaughterhouse. The annual fees are dependent upon the number of head to be slaughtered, ranging from \$20 to \$100. The bond is executed for the purpose of reimbursing owners of animals which have been stolen from them and slaughtered at the slaughterhouse. Every licensed slaughterer is required to keep the bill-of-sale or consignment slip covering the cattle or horses slaughtered by him on file in his office for one year.

Any producer of cattle may slaughter or have slaughtered for him on his own premises and for his own consumption and in small numbers cattle of his own production without procuring said slaughterer's license. One hundred eighty-three cattle slaughterers' licenses and 14 horse slaughterers' licenses were issued during the year.

Public Salesyards

Any person engaging in the business of the sale of cattle at a public salesyard must procure a license and execute a bond in the amount of \$1,000. This bond is filed for the purpose of reimbursing the owner of any animal which has been stolen and sold through the salesyard. All California cattle consigned to a public stockyard or a public salesyard must be accompanied by a certificate of consignment or brand inspection certificate. All cattle must be accompanied by proof of ownership. Such proof of ownership must be presented to the inspector upon his request before the cattle are inspected. Cattle may not be released from such yards unless accompanied by a brand inspection certificate or a bill of sale showing the date of sale, name and address of the buyer, description of the animal, and origin and destination of the cattle. Seventy public salesyard licenses were issued during the year.

Bills of Sale

No person may buy, sell, give away, or accept a bovine animal or bovine carcass without the seller giving and the buyer receiving a bill of sale, setting forth a complete description of the animal and the name and address of the buyer and seller. These bills of sale are often required by the inspector as proof of ownership.

Railroad Reports

When livestock is accidentally killed on a railroad right-of-way, and the owner of the animal is not known, the owner or operator of the railroad is required to report such accident within 96 hours to the nearest sheriff, constable, or brand inspector. A copy of the report must be sent to the bureau within 24 hours. A file of such reports is kept, and after a review of the brand records, if the owner can be found he is notified to file a claim with the railroad company.

Estrays

Any animal found in the possession of a person who cannot prove ownership is seized by the brand inspector. Any person finding an animal on his property or on a highway adjacent to his property must file a notice with the bureau within five days, giving a description of the animal and the location where it was found. If, after a review of the brand records, the owner cannot be found, a notice is posted in all the bureau's offices, and if the value of the animal exceeds \$40, the estray animal is advertised in a local newspaper in the area in which the animal was found, giving notice that if it is not claimed within a period of 30 days, the animal will be sold at a specified time and place. If the animal is not claimed within the 30-day advertising period, it is sold at public auction and the proceeds placed in a public trust fund for a period of one year during which time any person, on proper proof of ownership, may claim the proceeds of the sale.

A weekly bulletin is issued by the bureau listing all animals reported as lost, strayed or stolen, and animals returned to owners. This bulletin is forwarded to all brand inspectors and sheriffs' offices. A list of missing animals is printed monthly in the *California Livestock News*.

During 1957, 157 stray cases were closed by the bureau. The value of animals seized totaled \$4,798. One thousand seven hundred forty-eight animals, valued at \$172,731 were returned to their owners. These figures compare with the previous year's totals of 222 stray cases closed with a total value of \$4,715.08, and 1,645 stray animals returned to owners with a total value of \$107,105.75.

Enforcement Activities

All California Highway Patrol officers and other peace officers are required by

law to assist brand inspectors in enforcing the provisions of the Hide and Brand Law. The Bureau of Criminal Identification forwards all-points bulletins concerning livestock to the bureau regularly. The field staff works in close co-operation with local sheriffs' offices in investigating thefts of livestock, and the apprehending and prosecution of cattle thieves.

During the year 1957, 11 misdemeanor cases were filed by the bureau, resulting in nine convictions. Two felony cases were filed, resulting in one conviction. The defendant was sentenced to San Quentin Prison. Fifty-one violation notices were issued to persons for transporting cattle without a bill of sale or consignment, and 72 notices of violation were issued for transporting cattle without prior inspection.

Beef Promotion

The 1957 Legislature enacted Chapter 18 of Division 6 of the Agricultural Code, known as the California Beef Council Law which provides for the collection by field personnel of the Bureau of Livestock Identification of 10 cents per head on all cattle inspected, except hides, skins or reduction animals, cattle transported for purposes other than for sale or slaughter and without a change of ownership, animals less than three months of age, and animals sold for milk or calf production. The fee cannot be charged more than once to any single owner on the same animal. The purpose of the fee is for promoting the sale and consumption of beef and beef products. Each brand inspection certificate must be accompanied with a 10-cent beef promotion fee for each animal inspected or a reason for the fee not

being collected shown on the certificate. Any person desiring to be exempted from the payment of this fee may secure an exemption certificate from the Bureau of Markets in this department. Such exemption certificate or its number may be presented to the inspector and the owner may thereby be exempted from the payment of such fee. The exemption certificate number is placed on the brand inspection certificate. The collection of the beef promotion fees did not begin until November 1, 1957.

The bureau chief attended a brand committee meeting of the American National Cattlemen's Association, and the directors' meeting of the National Brand Conference in Phoenix, Arizona. The purpose of these meetings was to discuss amendments to the Packers and Stockyards Act and the federal brucellosis regulations.

The chief presided over the annual meeting of the National Brand Conference at Cheyenne, Wyoming, where 98 brand officials, representing 17 states, discussed various brand problems. The identification of cattle in order to comply with disease control regulations was the major topic of the conference.

A meeting of the Nevada Cattlemen's Association in Lovelock, Nevada, was also attended by the chief to assist and advise Nevada officials in the proposed revision of their brand laws.

The chief was the department's representative in a four-day conference with federal and state civil defense officials in Santa Rosa where he was called upon to supply information regarding available food supplies in California.

Bureau of Meat Inspection

DR. G. A. BOYD, *Chief*

DR. RAY W. McFARLAND, *Assistant Chief*

The enforcement of California laws pertaining to meat inspection is the responsibility of the Bureau of Meat Inspection. Sections 301 to 319 of the Agricultural Code contain provisions for the inspection of animals in slaughterhouses and of meat products in processing plants. The inspection of foreign cold storage meat is provided in Sections 321 to 325 of the code.

The work of the Bureau of Meat Inspection provides the public with protection from unwholesome or otherwise objectionable meat products; prohibits the sale commercially of uninspected meat in counties of over 28,000 population; maintains standards for sanitary construction and operation of meat slaughtering and packing establishments, and prevents mislabeling and adulteration of meat products.

Meat inspection is supported through money from the General Fund of the State appropriated for that specific purpose by the State Legislature. The total cost of state meat inspection for the budget year 1956-57 amounted to \$868,448, including \$51,519 for overtime work by inspectors. The cost of overtime is reimbursed to the State by the establishments involved.

The fortieth anniversary of state meat inspection in California was reached in 1957. From one plant under inspection in 1917, when the first voluntary meat inspection law was passed by the Legislature, the service has grown until today 367 establishments operate under state meat inspection. This great increase in meat plants is due to the State's tremendous population increase, and the constant demand for a larger wholesome meat supply. The growth of the service is illustrated and explained in Chart No. 1.

The 367 establishments operating under state inspection at the end of the year are located in 36 counties and 113 cities, extending from the Oregon state line to the Mexican border. Sixty-three of these plants conducted slaughtering, or slaughtering and processing, while 304 were engaged in meat

processing only. One hundred eleven state inspectors were employed in these plants; of these inspectors, 52 were veterinarians engaged in ante-mortem and post-mortem inspection, 12 were senior meat inspectors used in slaughterhouses in certain locations where their work could be properly supervised by veterinarians, and 47 meat inspectors were employed in meat processing work.

During the year 33 plants, formerly operating under state-approved inspection in Oakland and Sacramento, were granted state inspection when those cities discontinued their own meat inspection services on July 1st. This development leaves only San Francisco, with 55 establishments, and Marysville, with one plant; these continue to conduct their own approved meat inspection services. Approved plants are located in cities or counties which conduct their own municipal inspection service under the provisions of Section 301 (c) of the Agricultural Code.

One exempt plant discontinued operations during the year, leaving only two plants in the State operating under exemption in remote sections of counties in which inspection is mandatory. Exempt plants are small slaughterhouses in isolated locations in counties where meat inspection is mandatory, but which have been granted exemption from inspection under Section 307 (d) by the director because it is impracticable or impossible to assign an inspector to the plant.

Slaughtering

Animals slaughtered under state inspection in 1957 totaled 1,498,282, an increase of 50,678, or 3½ percent, over 1956. No slaughtering has been conducted in plants operated under approved municipal inspection since 1951.

Processing

State inspected meat plants produced 188,519,574 pounds of meat food products, an increase of 27,872,435 pounds, or 17 percent,

over 1956. Approved municipal inspected plants produced 39,552,352 pounds of meat food products, a decrease of 15,606,712 pounds, or 28 percent, under last year. This increase in state plants and decrease in approved plants was due largely to the fact that state inspection was extended to include the meat processing plants in Oakland and Sacramento.

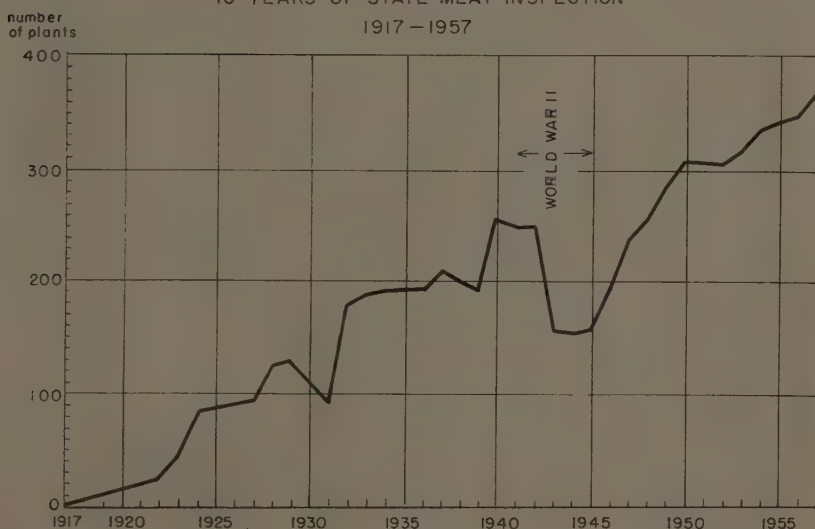
Labels

During 1957, 4,446 labels and sketches were reviewed; of these 84 failed to meet the regulatory requirements, and were not approved. The total of labels and sketches checked represents an increase of 45 percent over last year, and is the largest number acted upon in one year.

Foreign Cold Storage Meat

Foreign cold storage meat imported into the State showed a tremendous increase over the amount imported in 1956. A total of 18,151,064 pounds of foreign cold storage meat was inspected in 1957 representing an increase of 12,417,801 pounds, or 216 percent, over 1956. This meat was mostly frozen boneless beef from New Zealand, Australia and Mexico, but included frozen veal and mutton and a small amount of frozen lamb and pork. Foreign cold storage meat required 621 hours for inspection, the traveling of 2,303 miles incident to the inspection, and the collection of \$3,495.94 in inspection fees. Imported meat rejected and returned to the country of origin amounted to 76,567 pounds. In addition, 645,619 pounds were retained at the port of entry for further inspection and final disposition.

40 YEARS OF STATE MEAT INSPECTION
1917-1957



Fluctuations in the number of plants operating under state meat inspection are due to the following events: 1923-1924, outbreak of foot-and-mouth disease resulted in granting of inspection to many slaughterhouses on a temporary basis; 1932, meat inspection became mandatory in counties of 27,000 population or over; 1942-1943, transfer of state plants to wartime federal inspection; 1945-1947, return of plants from wartime federal inspection. State also at this time took over inspection in Santa Clara and San Diego Counties and in the Cities of Visalia and Pasadena; 1948-1949, State took over inspection in San Leandro and Long Beach plants; 1957, inspection in Sacramento and Oakland taken over by the State.

Licenses issued for handling foreign cold storage meat and license fees collected were as follows:

<i>License</i>	<i>Number</i>	<i>Fee</i>	<i>Total</i>
Wholesale	19 @	\$25	\$475
Retail	179 @	10	1,790
Importer	17 @	25	425
Restaurant	42 @	5	210

Total license fees collected..... \$2,900

Violations

During 1957, minor violations of the meat inspection provisions of the Agricultural Code resulted in 17 departmental hearings and two San Francisco Health Department hearings. Two district attorney citations were issued. Twenty-six notifications of violation of the Agricultural Code were issued. Six convictions for more serious violations of the Agricultural Code resulted in the collection of \$310 in fines, 80 days of suspended jail sentences, and the imposition

of six years of probation to offenders. As a result of the court action, 1,306 pounds of meat and products were condemned as unfit for human consumption.

Construction

Construction of new plants and the remodeling of existing ones continued to keep pace with the increases in meat production. During the year, 51 plans for construction of meat establishment facilities were approved.

Meat Inspection Laboratory

During 1957, the meat inspection laboratory examined 1,749 samples of various products and materials for conformity with State Meat Inspection Law and Regulations. The most frequent violations were for excessive added water and fillers in sausage, and excessive fat in hamburger and pork sausage. In no case were preservatives de-



One illegal insanitary slaughtering operation eliminated following prosecution. Investigations of such operations are conducted by representatives of the Bureau of Meat Inspection in the enforcement of the meat inspection laws.

TABLE 1

<i>Product or material</i>	<i>Passed</i>	<i>Not passed</i>	<i>* Not classified</i>	<i>Total</i>
Meat and meat products.....	1,220	290	6	1,516
Edible oils and fats.....	3	..	---	3
Curing materials.....	107	11	2	120
Cereals, spices, condiments.....	64	6	---	70
Miscellaneous.....	36	3	1	40
Totals.....	1,430	310	9	1,749

* Refers to samples received in condition not suitable for proper analysis.

tected. Among miscellaneous items examined were meat tenderizers, phosphate mixtures, insecticide solutions and antioxidant chemicals.

Tabulated results of these examinations is shown in Table 1.

The number of samples examined this year represents an increase of 483, or 38 percent, over last year, a significant aid in the quality control of meat food products.

Condemnation Summary

Under state inspection, 3,109,457 pounds of meat and meat products were condemned as unfit for food. This figure included 6,497 entire carcasses and 277,318 parts condemned on ante-mortem and post-mortem inspection, and 410,427 pounds of processed products. Under state-approved municipal inspection, 14,919 pounds of processed products were condemned.

Of interest in this connection is the loss suffered each year in the meat packing industry due to the condemnation of cattle livers affected with flukes or abscesses. During the past year 76,198 livers were condemned for flukes, a decrease under last year of 2,345, and 47,433 livers were condemned for abscesses, a decrease of 3,109 under 1956. Twenty-six and one-half percent of all beef livers inspected were condemned for either flukes or abscesses.

A total of 1,102 carcasses were retained for tuberculosis; fourteen of them were condemned as unfit for food.

There were 388 cattle retained for cysticercus bovis (the intermediate stage of a human tapeworm). This total is 87 less than the number of carcasses similarly infested last year. Of the number retained, 184 were passed for food after removal of the parasite, 200 following freezing, and two carcasses were condemned.

TABLE 2
Number of Animals Slaughtered at Federal and State Establishments

<i>Species</i>	<i>State inspection</i>		<i>Federal inspection</i>	
	<i>Inspected</i>	<i>Condemned</i>	<i>Inspected</i>	<i>Condemned</i>
Cattle.....	465,394	1,052	1,952,755	3,506
Calves.....	303,122	1,230	434,021	2,928
Sheep.....	483,017	3,804	1,759,534	9,876
Swine.....	245,083	401	1,617,806	4,492
Goats.....	1,666	10	---	---
Total.....	1,498,282	6,497	5,764,116	20,802

There were approximately 180,000 head of cattle, calves, sheep and swine that were not inspected in 1957. This includes animals slaughtered on farms, animals slaughtered in

uninspected slaughtering establishments located in counties of less than 28,000, and establishments operating under inspection exemption.

Number of Animals Condemned for Various Diseases—State Inspection—1957

Disease	Cattle		Calves		Sheep		Swine		Goats		Total	
	Car.	Lbs.	Car.	Lbs.	Car.	Lbs.	Car.	Lbs.	Car.	Lbs.	Car.	Lbs.
Actinomycosis.....	15	6,004	1	325							16	6,329
Anaplasmosis.....	8	5,021									8	5,021
Arthritis and other bone diseases.....	14	5,684	29	1,760	197	8,941	53	7,962	1	15	294	24,362
Asphyxia.....	1	600	2	130			1	175			4	905
Carditis.....	230	109,273	9	1,088	18	899	2	405			259	111,665
Caseous lymphadenitis.....					960	39,391			1	55	961	39,446
Contamination.....					38	1,960	2	125			40	2,085
Cysticercosis.....	2	1,070			9	419	2	420			13	1,909
Cystitis.....	1	650									1	650
Droptical diseases.....	15	6,940	2	80		114	1	90			21	7,224
Emaciation.....	41	13,928	151	5,107	1,548	52,805	5	599	1	49	1,746	72,488
Erysipelas.....							7	1,013			7	1,013
Hemorrhagic septicemia.....	2	1,225									2	1,225
Hepatitis.....	5	2,300									5	2,300
Icterus.....	8	3,952	54	2,944	133	5,974	103	15,473			298	28,343
Immaturity.....			661	25,919	4	95			1	5	666	26,019
Injuries.....	14	5,589	20	1,994	8	414	6	1,267	1	20	49	9,284
Leukemia.....	3	1,485									3	1,485
Melanosis.....			1	85							1	85
Metritis.....	48	23,716			11	546	4	512			63	24,774
Miscellaneous.....	3	1,216	3	130	4	120					10	1,466
Nephritis.....	18	8,311	13	823	6	315	1	190			38	9,639
Omphalophlebitis.....			24	1,250							24	1,250
Pneumonia, pleurisy, enteritis, peritonitis, etc.....	148	62,783	211	15,061	498	22,760	121	15,143			978	115,747
Pregnancy and recent parturition.....	8	3,908			1	115					9	4,023
Sarcosporidiosis.....	25	11,923									25	11,923
Septicemia and pyemia.....	363	159,543	46	6,303	364	17,692	72	11,570	5	256	850	195,364
Sexual odor.....					1	175	12	1,576			13	1,751
Skin disease.....							1	156			1	156
Tetanus.....	1	450									1	450
Toxemia.....	2	748	1	200							3	948
Tuberculosis.....	2	4,385	1	228			4	870			7	5,483
Tumors, carcinomata, sarcomata, etc.....	68	32,745	1	110	1	42	4	894			74	33,791
TOTAL.....	1,052	473,449	1,230	63,537	3,804	152,777	401	58,440	10	400	6,497	748,603

Bureau of Poultry Inspection

L. E. BARTELT, D.V.M., *Chief*

H. W. STAGGS, D.V.M., *Assistant Chief*

The Bureau of Poultry Inspection is now in its second year of enforcement of poultry inspection laws adopted by the 1955 Legislature. The function of this bureau is, through inspection, to provide the consumer with a source of wholesome poultry and rabbit meat. The fact that the product has been inspected for wholesomeness is indicated by the Department of Agriculture's approved inspection legend.

The bureau is charged with the enforcement of those sections of the Agricultural Code pertaining to the sanitary processing of poultry and rabbit meat, the inspection of such meat for wholesomeness, the minimum construction requirements of the processing plants and the licensing of plants.

The provisions of Articles 1 and 2 of Chapter 3, Division 3 of the Agricultural Code, enforced by this bureau, became effective July 1, 1956.

Poultry Laws Amended

The 1957 Legislature made important changes in Articles 1 and 3 of Chapter 3, Division 3 of the Agricultural Code pertaining to poultry plant sanitation and the inspection of poultry meat for wholesomeness. Some of the more important changes are as follows:

1. Clarification of the producer exemption sections of the laws by defining a producer as being any person engaged in a business of feeding and caring for poultry for a period of three weeks or more for the purpose of increasing its size and weight.

2. Specifying of subject material of which an applicant must prove his knowledge prior to his being issued a license to inspect poultry meat.

3. Requiring of a yearly renewal of poultry meat inspectors licenses and the assessing of a \$5 application renewal fee.

4. Deleting of the provision that required poultry meat processed under the supervision of approved inspection agencies, other than the Federal Poultry Inspection Service, functioning outside of the State of California, to be cut up or repacked only in plants licensed by the State of California.

5. Granting to the State Director of Agriculture the power, after hearing, to refuse to issue, reissue or revoke poultry plant licenses when the licensee failed to comply with the provisions of the law or the regulations adopted thereunder.

Sanitary Supervision

The major activity of this bureau during 1957 was the surveying of existing poultry plant facilities. Inspectors, trained for this work by the bureau, inspected each licensed poultry plant in order to determine what improvements might be necessary to bring the plant's facilities up to the sanitary requirements of the Agricultural Code and the regulations promulgated thereunder.

Following the plant surveys, a letter was sent to each operator whose plant was surveyed outlining the improvements considered necessary for the plant to make to enable it to meet the state minimum sanitary requirements. Followup visits were then made to each plant by our inspectors in order to discuss the survey requirements as outlined in the survey letters. In accordance with the law, each licensee was given six months in which to comply with the survey requirements. In some instances, where extenuating circumstances existed, additional time for compliance was granted to those making reasonable efforts to comply.

Constitutionality of Law Attacked

On October 25, 1957, the department was temporarily restrained from enforcing that



Regulations require that poultry carcasses be chilled to 40° F. or less before packaging

part of the Agricultural Code pertaining to poultry plant sanitation. A restraining order, issued by the Fresno County Superior Court, applied to 59 of the 528 plants licensed by the department.

On December 27, 1957, a stipulation changing the nature of the injunction was filed. As a result, a new court order was issued which restrained the department from enforcing Article 7 of the regulations in 59 plants. Article 7 dealt only with construction requirements.

General Compliance

Poultry meat processors generally responded favorably to the requests in the letters they received outlining changes necessary in plant facilities and equipment. At the close of the year, only a small number of processors had not started to make changes in their processing procedures, equipment and physical facilities in order to meet the minimum sanitary requirements.

Bureau Organization

While the bureau was created October 5, 1955, and began enforcing the new laws on July 1, 1956, it was not until July, 1957, that it was sufficiently staffed to actively en-

force the new laws and regulations on a statewide basis. Some variation was found in original estimates of the number of plants that would come under inspection and, consequently, some adjustment in the original plans regarding staffing became necessary.

At the end of the year, for enforcement purposes, the State was divided into three areas. The southern area had the largest number of poultry plants. There were 301 licensed plants in the 11 counties, south and west of Kern County, in this area. The bureau force in this area consisted of two veterinarians II, seven veterinarians I, seven poultry plant sanitation inspectors and one intermediate stenographer-clerk—all under the supervision of one veterinarian III. There were 660 licensed poultry meat inspectors in this area. A new area office located at 2338 South Garfield Avenue, Monterey Park, was established on July 17, 1957.

The San Francisco area had one veterinarian III as area supervisor, one veterinarian II, four veterinarians I, and one poultry plant sanitation inspector and one intermediate stenographer-clerk. There were 130 poultry processing plants licensed by the department in the 15 coastal counties which comprise this area. There were 316 licensed poultry meat inspectors in this area. The new area office was established at Room A, 507 Polk Street, San Francisco, on August 9, 1957. The office is occupied jointly with the Bureau of Meat Inspection and that bureau also defrays 50 percent of the salary of the intermediate stenographer-clerk and other costs of operating this office.

Headquarters in Sacramento

Sacramento, location of the home office for the bureau, is also headquarters for the north central area which was comprised of 31 counties. There were 97 licensed poultry plants in this area. The bureau force consisted of two veterinarians II, three veterinarians I and three poultry plant sanitation inspectors. There were 298 licensed poultry meat inspectors in this area. The administrative and clerical staff of the Sacramento office consisted of the bureau chief, assistant chief, one senior stenographer-clerk, two intermediate stenographer-clerks and one intermediate typist-clerk.

TABLE 1

Summary of Poultry Processed, January 1-December 31, 1957

Class	Live weight processed	* RTC weight iced	* RTC weight frozen	* RTC weight total
Chickens	38,913,190	35,307,929	1,712,174	37,020,103
Turkeys	18,370,855	9,769,016	3,723,732	13,492,748
Rabbits	9,928,724	4,547,412	4,365	4,551,777
Other poultry	1,955,309	864,710	267,480	1,132,190
Total	69,168,078	50,489,067	5,707,751	56,196,818

* Ready-to-cook.

Enforcement Activities

The bureau is not only charged with the enforcement of wholesomeness and sanitary inspections in the state licensed poultry processing plants, but also must keep a close check on processed poultry in the channels of trade. In order to prevent the sale of uninspected poultry meat, bureau fieldmen occasionally check retail stores. There were 233 known producer-operated plants operating under the exemption provisions, as set forth in Section 375.6, of the law. Considerable effort was spent in checking these plants to make certain they were not operating in violation of the law.

The Director of Agriculture is charged with determining whether the poultry from out-of-state processing plants which are under the supervision of an approved inspection service meets requirements equivalent to those of California. Therefore, an important feature of the program consisted in checking out-of-state poultry at points of distribution, retail stores and in state licensed poultry plants.

During 1957, the bureau held four informal hearings and one investigational hearing. The bureau obtained a court injunction against one poultry processor who was operating an insanitary plant. In all but one instance compliance was obtained. In the case which required an investigational hearing, it was necessary to take court action against the defendant.

Notices of Violation

During 1957, 369 notices of violation were issued by bureau inspectors for the following violations:

Operating under insanitary conditions—70. Improper labeling of poultry products—167. Operating without a plant license—20. No poultry meat inspector on duty or inade-

quate inspection by a poultry meat inspector—34. Failure to keep forms as required—5. Improper processing—4. Building or remodeling without obtaining approval of plans—9.

Training Program

In accordance with provisions of the poultry inspection laws which require the bureau to hold training courses for poultry meat inspectors from time-to-time, the bureau has assigned personnel to the planning and conducting of schools of instruction for licensed poultry meat inspectors. The first subjects covered revolved around poultry plant clean up, including mechanical and chemical cleaning agents, and a study of equipment designed for easy cleaning. A film was shown which covered a food poisoning outbreak and stressed the importance of those sanitary measures which could have prevented it.

During 1957, training sessions were held at seven different locations throughout the State. This program will continue into 1958.

Processing

During 1957, the poultry processing plants operating under state supervision reported processing 69,168,078 pounds, live weight, of poultry. The ready-to-cook weight reported from this amount was 56,196,818 pounds. An undetermined amount went as New York dressed poultry, but this amount is not regularly reported.

Condemnation Summary

During 1957, 129,108 poultry carcasses were reported condemned as unfit for human consumption. A total of 2,074,337 pounds of poultry meat were condemned. This latter figure included the whole carcasses as well as the parts trimmed and condemned.

TABLE 2
Summary of Poultry Condemned,
January 1-December 31, 1957

Class	Total number birds rejected
Chickens	104,375
Turkeys	6,160
Rabbits	17,259
Other poultry	1,314
Total	129,108

Out-of-state Poultry

The poultry inspection laws provide for the approval of poultry inspection services in other states. This activity developed into one of greater magnitude than was originally anticipated when the bureau was organized.

The laws and regulations of a number of out-of-state inspection services were analyzed. Those who were regarded as having requirements equal to those of California were approved by the director. They were: Alabama Department of Agriculture and Industries; Connecticut Department of Agriculture; Georgia Department of Agriculture; Louisiana Department of Agriculture and

Immigration; Mississippi Department of Agriculture and Commerce; Seattle-Kings County Department of Health; Texas State Department of Health.

Licenses Issued

Poultry licenses issued and fees collected during the 1957 calendar year are summarized as follows:

Meat inspector (new)	242	\$2,420
Poultry plant	531	21,240
Meat inspector (renewal)	502	5,510

The fee for a new poultry meat inspector license is \$10, and for a renewal, \$5. The poultry plant license fee is \$40.

Construction Plans Reviewed

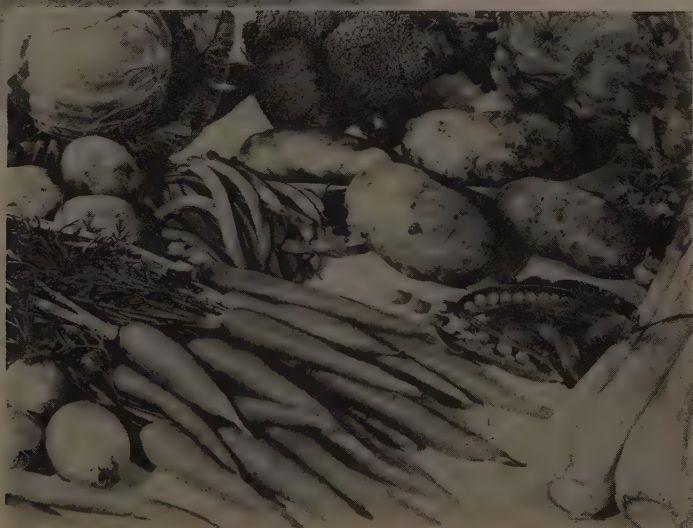
All plans for construction of new facilities, and for major reconstruction of existing poultry plants must be submitted to this bureau for approval. Eighty-one sets of plans were submitted and approved up to December 31, 1957. During this same period, five sets of plans were not approved and returned to the plant operators for their further consideration.

DIVISION OF MARKETING

W. J. KUHRT, *Chief*



Agricultural Statistics
Fruit and Vegetable
Standardization
Market Enforcement
Market News
Markets
Milk Control
Shipping Point Inspection
Weights and Measures



Division of Marketing

W. J. KUHRT, Chief

The Division of Marketing is composed of eight bureaus: Markets, Market Enforcement, Milk Control, Market News, Agricultural Statistics, Fruit and Vegetable Standardization, Shipping Point Inspection, and Weights and Measures. The Chief of the Division of Marketing has the responsibility of supervising in a general way the work of these bureaus. The duties, responsibilities and activities of each of these bureaus are presented in detail in the bureau reports which follow.

The year 1957 was characterized primarily by efforts to strengthen and to increase the efficiency of the bureaus in the division, and to put into operation new legislation enacted in the 1957 Session of the Legislature. Among the steps taken to increase efficiency were the improvements in supervision developed in the Bureaus of Milk Control, Fruit and Vegetable Standardization, Agricultural Statistics, and Weights and Measures. In certain others, such as Market Enforcement, additional personnel were employed in order to attain reasonable coverage throughout the State.

Developments of interest in the Division included the following:

(a) The Bureau of Milk Control has put into operation throughout the State the amended standards for the establishment of minimum producer prices applicable under the Milk Control Act.

(b) The Bureau of Market News is engaged in making effective the new services for reporting prices on hay and grain at Fresno and at El Centro. The bureau also spent much time in working out a more satisfactory plan for reporting butter prices on the San Francisco Market.

(c) The Bureau of Agricultural Statistics has spent much time in endeavoring to develop a more workable arrangement with the Giannini Foundation with respect to the administration of the Research and Marketing Act programs covering objective sampling.

(d) The Bureau of Market Enforcement began tightening its procedures regarding the issuance of licenses, as a result of the amendments to the Produce Dealers Act. The new procedures require applicants to file financial statements to satisfy the director with regard to their solvency and financial responsibility.

(e) The Bureau of Weights and Measures has been working out details preparatory to administrative hearings so as to put into effect tolerances authorized by amendments to the Business and Professions Code.

(f) The Bureau of Markets is putting into effect amendments to the California Marketing Act relating to the application of triple damages for certain violations and also authorization to require a decree of specific performance in designated cases.

(g) On September 1, 1957, the Bureau of Shipping Point Inspection found it necessary to increase the carlot fee from \$10.80 to \$12. This action was taken to overcome losses sustained by reason of increasing salaries and other costs of carrying on the inspection work.

(h) The Bureau of Fruit and Vegetable Standardization has a number of pieces of new legislation to make effective, involving mostly amendments to grades and standard containers.

Bureau of Agricultural Statistics

N. I. NIELSEN, *Chief*

W. WARD HENDERSON, *Assistant Chief*

The Bureau of Agricultural Statistics, known as the California Crop and Livestock Reporting Service, is jointly supported under a co-operative agreement between the California Department of Agriculture and United States Department of Agriculture. Under this arrangement, the bureau prepares and publishes the basic records and current estimates of California's agricultural production, prices, and related factors. The reports range over 60 different crops and seven species of livestock and poultry, with subclassifications as appropriate by variety, season of production, utilization and, in the case of livestock, age and sex groups. In addition, estimates are made of the prices paid by farmers for about 150 items.

In general, forecasts of production are made during the growing season for all principal crops, followed later by final estimates of their production and value. Stocks of grain, rice, hay, potatoes, and onions are determined at specified times during the year. Numbers of livestock and poultry are estimated annually, as are items of production and value of the principal livestock and livestock products. In addition, estimates are published monthly covering production of milk and eggs and of average prices for many farm products. Weekly estimates are made of chicks and poults hatched. Numbers of cattle in feedlots are published quarterly. During 1957 the bureau published approximately 300 reports relating to the State's agriculture, as well as answering numerous individual requests. The basic information for the reports is obtained primarily through the co-operation of the county agricultural commissioners, and thousands of farmers, stockmen, hatcherymen, dealers, processors, and warehousemen who make reports directly to this office. These reports are also based upon information made available by many other individuals and companies identified with the farming industry of the State.

Near Record Crop Production Total

The volume of crop production in California in 1957 was of near record proportions, but some decline occurred in value of production.

A check at the end of 1957 indicates that the combined production of the main field, fruit and nut, and vegetable crops totaled 29,879,000 tons, only a trifle under the record of 29,961,600 tons produced in 1956, but well above any previous year. The heavy volume of crop production was due to the record output of field crops, since the total production of fruits, nuts, and vegetables was well under last year.

With lower prices received to date for the majority of crops, the total value of 1957 crop production (exclusive of livestock and livestock products) at \$1,748,708,000 is 5 percent under 1956. It is also under 1951 and 1952, but above the value of crop production in any other year.

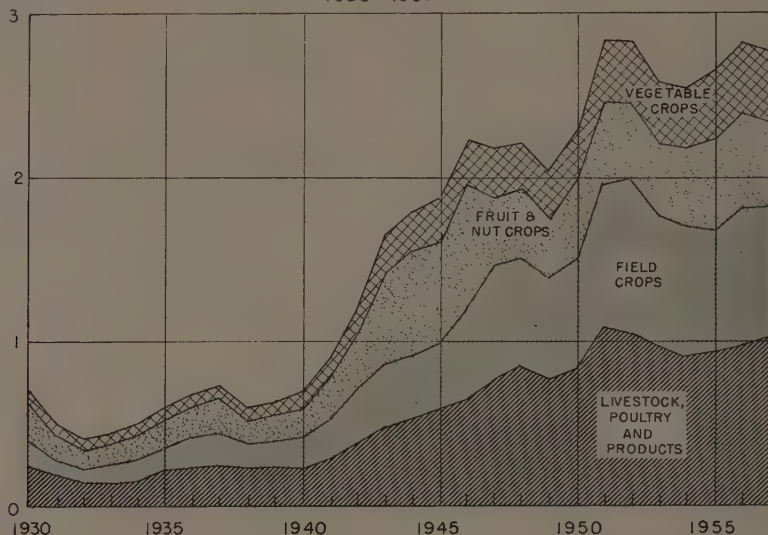
In comparison with last year, value showed some decline in both the field crop and the fruit and nut crop groups, but a slight increase was registered in vegetables.

With the overall value picture not so favorable as in 1956, it also should be kept in mind that production expenses have continued high. For the last few years, they have taken nearly two-thirds of the producer's dollar. (The figures on value of production do not represent income to farmers, and therefore are not comparable with cash receipts from farm marketings.)

The large 1957 volume of crop production was harvested from approximately 8,528,000 acres. This is the smallest acreage harvested since 1951, and is 3 percent under the record acreage harvested in 1953. The 1957 acreage, however, is 22 percent above the average acreage harvested during the 10-year period 1930-39, but that is a small increase compared with volume of production which almost doubled during this same period.

VALUE OF PRODUCTION OF
PRINCIPAL CROPS & LIVESTOCK, POULTRY AND PRODUCTS
1930-1957

BILLIONS
OF DOLLARS



Higher yields per acre, obtained through new varieties and improved farming practices, are largely responsible for the rapid increase in volume of production, although shifts to higher yielding crops also have played a part.

Factors having an influence on 1957 crop production were varied. The season got off to a rather poor start since precipitation was much below normal through December, 1956. Under the near drought conditions, fall and early winter range and pasture feed was short in many areas, and the germination of fall-seeded dryland grains was slow and irregular, with some reseeding necessary. With rainfall after the first of the year about normal, recovery was good, but the late spring rains did cause rather serious loss to cherries and strawberries. Losses from late spring frosts were of only local importance, and growing weather was quite generally favorable during the summer. Unusually heavy October rains, however, delayed harvest and caused some loss in both quantity and quality to a few late

crops—particularly wine grapes, tomatoes, dry beans, and sudan grass seed. With a return to more normal weather in November, the 1957 harvest was about completed by December 1st except on sugar beets and cotton.

TABLE 1
Combined Acreage, Production and Value
of Principal Crops in California

	Acreage harvested (1,000 acres)	Production (1,000 tons)	Value (1,000 dollars)
1937-41 average..	7,407	18,619	\$455,931
1942-46 average..	7,833	21,707	1,233,684
1947	8,213	24,926	1,413,597
1948	8,400	23,768	1,367,945
1949	8,465	23,196	1,263,068
1950	8,364	25,680	1,482,239
1951	8,443	26,234	1,782,914
1952	8,735	26,242	1,773,605
1953	8,790	26,790	1,606,142
1954	8,788	28,125	1,642,110
1955	8,564	28,959	1,693,873
1956	8,579	29,962	1,843,135
1957 preliminary	8,528	29,879	1,748,708

TABLE 2

**Principal¹ Field Crops, California
Combined Acreage, Production, and Value**

	Acreage harvested (1,000 acres)	Production (1,000 tons)	Value (1,000 dollars)
1937-41 average..	5,367	10,047	\$174,801
1942-46 average..	5,731	10,998	407,553
1947	6,114	13,009	664,396
1948	6,361	12,809	658,434
1949	6,477	12,760	612,286
1950	6,376	15,100	685,390
1951	6,427	13,075	895,938
1952	6,776	14,017	946,211
1953	6,868	15,008	778,648
1954	6,886	16,828	800,525
1955	6,661	15,952	744,086
1956	6,664	16,210	833,074
1957 preliminary	6,639	17,353	799,503

¹ Includes nine leading field seeds.

TABLE 3

**Principal Fruit and Nut Crops, California
Combined Acreage, Production and Value**

	¹ Acreage (bearing) (1,000 acres)	Production (1,000 tons)	Value (1,000 dollars)
1937-41 average..	1,513	6,157	\$184,323
1942-46 average..	1,506	7,240	587,124
1947	1,467	7,735	431,560
1948	1,441	7,169	421,784
1949	1,409	6,541	359,796
1950	1,385	6,512	509,572
1951	1,355	7,769	505,646
1952	1,326	7,039	449,899
1953	1,306	6,814	458,066
1954	1,281	6,382	473,786
1955	1,236	7,393	541,219
1956	1,198	7,180	579,908
1957 preliminary	1,197	6,730	514,547

¹ Includes acreage of chestnuts, filberts, pecans, limes, and quince on which production and value are not estimated.

TABLE 4

**Principal Vegetable Crops, California
Combined Acreage, Production, and Value**

	Acreage harvested (1,000 acres)	Production (1,000 tons)	Value (1,000 dollars)
1937-41 average..	528	2,415	\$96,808
1942-46 average..	596	3,469	239,007
1947	632	4,182	317,641
1948	599	3,789	287,727
1949	580	3,894	290,986
1950	604	4,068	287,277
1951	661	5,390	381,330
1952	633	5,185	377,495
1953	616	4,968	369,428
1954	620	4,916	367,799
1955	667	5,614	408,568
1956	717	6,571	430,153
1957 preliminary ..	693	5,796	434,658

**Horticultural Specialties Added
to Estimating Program**

In early 1957, surveys were conducted for the first time to determine the value of production of cut flowers and nursery products. The survey covering eight major nursery products in California revealed sales amounting to \$19,853,000 in 1956. The sales of four important cut flowers accounted for an additional \$13,268,000. Similar data covering 1957 sales are being collected currently, and will be summarized later.

Egg and Turkey Production at New Highs

New production records were established by the egg and turkey industries in 1957, but the production of broilers and fryers dropped to the lowest level since 1950. Chicken egg production has increased every year for the past 10 years. Larger numbers of birds in laying flocks and improvements in egg production per bird have contributed to the greater output of eggs. In 1957, about 4.6 billion eggs were produced in California farm flocks, 2 percent more than in 1956. Greater production per bird accounted for most of the increase. Even though the average prices received by farmers for eggs the latter part of the year were higher than the latter part of 1956, the annual average was sufficiently lower to result in a decline in cash farm receipts.

The 1957 turkey crop numbered 14.5 million turkeys, 15 percent larger than the crop the previous year and over three times the number raised 10 years ago. The price picture was dismal all year, and total cash farm receipts were lower than in 1956 despite the increase in numbers marketed. Broiler and fryer chicken production showed the first substantial change in six years, declining 16 percent from the 1956 level. The average price received by farmers moved downward slightly; consequently, cash farm receipts were about 20 percent under the 1956 amount.

More milk was produced in 1957 than ever before. An increase of approximately 5 percent over 1956 production, the previous record year, resulted from a combination of increased numbers of milk cows and a greater output of milk per cow. The wholesale farm price of whole milk was slightly higher than in the year 1956.

Marketings from feedlots finishing cattle and calves were 4 percent greater than in 1956. The number of cattle slaughtered in the State, however, was 165,000 head less

than the year before, a reduction of 6 percent. Calf slaughter declined about 4 percent. Prices for cattle and calves were well above the 1956 level.

Both the lamb crop and the quantity of wool shorn from sheep and lambs were down slightly from the previous year. Sheep and lamb prices were somewhat higher and wool prices were substantially higher than in 1956. The number of sheep and lambs slaughtered during the year was almost the same as in 1956.

The pig crop in California was 3 percent larger than a year earlier. The 1956 crop was the smallest on record. Slaughter plants processed 19 percent fewer hogs and pigs than in 1956. Prices received by farmers in 1957 were greatly improved in comparison with 1956.

TABLE 5
All Livestock: Estimates of Numbers on
Farms and Ranches January 1st
California, 1955-1958

	Thousand head			
	1955	1956	1957	1958
All cattle and calves	3,863	3,863	3,870	3,733
Cattle on feed ¹	467	489	496	393
Milk cows,				
two years + ¹	909	927	936	955
Sheep and lambs				
Stock animals	1,700	1,700	1,632	1,616
On feed	312	320	352	250
Hogs	461	452	438	442
Horses and mules	84	78	73	71
All chickens ²	27,423	29,063	28,994	29,277
All turkeys ³	1,159	1,194	1,609	1,578

¹ Included in totals.

² Does include commercial broilers.

³ Does not include turkey fryers.

National Parity Ratio Unchanged for 1957

Along with the preceding statements summarizing the 1957 season in California, it is of interest to review the national index of prices paid (parity index), the index of prices received, the parity ratio, and production expenses as a percent of gross farm income. The parity ratio is the ratio of the prices received index to the prices paid index. Corresponding indexes are not available for California, but the agricultural situation in California follows that of the Nation rather closely.

The index of prices paid by farmers stood at 292 in January, 1957, which was a record high at that time. Except for minor declines in July and August, the index has shown a gradual climb to 301, a new all time high, in January, 1958. During the six years prior to 1957, the overall change in the prices

paid index has been relatively small in contrast to the rather steady and substantial decline in the prices received index during this same period.

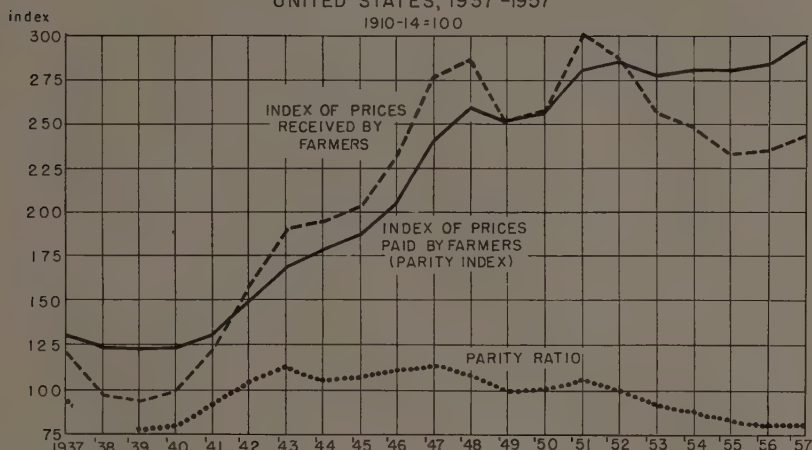
The prices received index improved somewhat in 1957, only to be offset by the record high prices paid index. The record high in the prices received index was in February, 1951, when it was 313, and the parity ratio was well above 100. In 1952, the prices paid index and the prices received index were about in balance as indicated by the parity ratio of 100. By December, 1955, the parity ratio had dropped to 80, making clear the relatively unfavorable price position of agriculture in general. During the first half of 1956, there was some improvement in the parity ratio, followed by a drop in August. From that time until January, 1958, it has remained practically unchanged and the 1957 annual average of 82 is unchanged from the 1956 parity ratio.

Since 1953, production expenses have crept steadily upward, and for the first nine months of 1957 were exceeding the previous high of 1952. Production expenses now take approximately two-thirds of the producer's gross income, whereas they were taking only about half during World War II and the years immediately following.

TABLE 6
Indexes of Prices, United States, 1937-1957

	Index of prices paid by farmers (parity index)	Index of prices received by farmers	Parity ratio	Production ex- penses in percent of gross farm income
	Indexes 1910-14 = 100			Percent
1937	131	122	93	54
1938	124	97	78	58
1939	123	95	77	58
1940	124	100	81	61
1941	133	124	93	56
1942	152	159	105	53
1943	171	193	113	49
1944	182	197	108	50
1945	190	207	109	50
1946	208	236	113	49
1947	240	276	115	49
1948	260	287	110	54
1949	251	250	100	57
1950	256	258	101	60
1951	282	302	107	60
1952	287	288	100	61
1953	279	258	92	60
1954	281	249	89	64
1955	281	236	84	66
1956	285	235	82	65
1957 preliminary	296	242	82	— ^a

INDEXES OF PRICES UNITED STATES, 1937-1957



INDEXES BY MONTHS SINCE JANUARY, 1957

January, 1957	292	238	82	65 ¹
February	294	234	80	
March	295	238	81	
April	296	242	82	65 ²
May	296	243	82	
June	296	244	82	
July	295	247	84	65 ³
August	295	248	84	
September	296	245	83	
October	296	240	81	— ⁴
November	298	242	81	
December	299	242	81	
Average	296	242	82	65
January, 1958	301	247	82	—

^a Not yet available for 1957.

¹ First quarter.

² Second quarter.

³ Third quarter.

⁴ Fourth quarter.

Research and Marketing Act Projects

Surveys to provide early season forecasts of production by physical counts and measures were continued for clingstone peaches, Bartlett pears, and grapes. These projects are financed jointly by the industry groups concerned and federal funds made available under provisions of the Federal Research and Marketing Act. They were undertaken at the request of the industry groups in an effort to provide greater precision and reliability in the bureau's forecasts of these crops. In the research phases of these proj-

ects, the bureau has the active technical assistance of staff members of the Giannini Foundation of Agricultural Economics of the University of California.

The objective forecasting system which has shown the most promise to date for the three crops named is of the ratio type—i.e., it utilizes early season measures to forecast changes from base year to current year in number of fruit per tree and average size of fruit. These ratios are then combined with the change in bearing acreage to indicate the change in total production from the base year. For cling peaches, the objective techniques have provided quite satisfactory June forecasts, except in 1954 and 1957 when brown rot and pre-harvest drop reduced the size of the crop substantially. This observation indicates the need to appreciate the limitations of any system in forecasting production when unusual losses can occur between the time of the survey and harvest. Perhaps successive surveys through the season until harvest will be called for to measure these losses. The projects were more successful in 1957 in forecasting production of Bartlett pears and grapes with reasonable accuracy. Nevertheless, past experience has shown that the prediction of harvest size or weight is more difficult than for peaches. In the case of pears, this is primarily because the individual fruit can continue to increase in weight after it is sufficiently mature to harvest. For grapes, the difficulty

may lie in the shifting of volume-size relationship through the growing season. In spite of these problems, which are receiving further attention, the projects can be regarded as successful in developing the framework for more precise and practicable estimating systems.

The fruit and nut acreage surveys were continued, being financed through matching state and federal funds, also under the Research and Marketing Act. The information acquired in these surveys shows the acreage of fruits and nuts by kinds, by varieties, by age groups, and by counties. The data provided in the annual bulletin is widely used by individuals, groups, and agencies involved in producing, processing, and marketing these crops. This work is carried out in co-operation with the county agricultural commissioners.

The October 1st raisin lay survey was again conducted with very satisfactory results. At this time, it appears that the forecast will be within a few percentage points of the final raisin production for the season. The raisin project is financed entirely by the Raisin Administrative Committee, the committee which operates the federal marketing agreement and order.

New Developments

The bureau participated for the first time in 1957 in the cotton yield research project being conducted by the U. S. Crop Reporting Service in all cotton states. The sample in California consisted of 50 fields in which plant and fruit counts were made in small plots at three different times during the growing season, followed by post-harvest observations to determine final yields and to gather information on harvest losses. The study is designed to develop forecasting equations for cotton yield from the field counts.

Arrangements were completed for the bureau to issue the *Weekly Weather and Crop Bulletin* at the beginning of 1958. The report formerly had been issued by the State Climatologist of the U. S. Weather Bureau.

Under the new co-operative arrangements, the Weather Bureau continues to supply the weather data and summary, while the bureau takes over the task of writing the summary statements on the effects of weather on crops and livestock, as well as the issuance of the report. This comprehensive weekly review of crop and livestock conditions is made possible by regular reports to the bureau from the county agricultural commissioners, the Agricultural Stabilization Committee county office managers, some bank officials and *Market News* reporters, and a few other individuals. In addition to expanding the sources of information on crop conditions, the number of reporting weather stations covered by the bulletin has been increased to 45.

At their annual meeting in May, 1957, the county agricultural commissioners passed a resolution asking the bureau to assist them in co-ordinating their statistical programs. While the commissioners have had a responsibility for a number of years to compile data on the production and value of crops and livestock in their counties, these data have not always been on a comparable basis among counties, or with corresponding data for the State as prepared by the bureau. The commissioners' resolution foreshadows an integrated statistical program within the State, just as the statistical program of the State is integrated with those of other states and the national program.

Arrangements were made for the bureau to make detailed surveys of strawberry growers to obtain acreage and yield information by age of planting during the 1958 season. The county agricultural commissioners, the Bureau of Markets, and the Strawberry Advisory Board will assist in the preparation and conduct of the survey, with the latter agency providing the financing for the additional field work necessary. These surveys should provide better information relative to potential strawberry production, which is so vital to the industry in making its production and marketing plans.

Bureau of Fruit and Vegetable Standardization

H. W. POULSEN, *Chief*

S. R. WHIPPLE, *Assistant Chief*

The purpose of standardization is to maintain and improve the quality and reputation of California agricultural products in the State, Nation, and the world.

Standardization requirements apply to 35 varieties or types of fresh fruits and vegetables, walnuts, poultry and rabbit meat, honey, and eggs.

Activities of the bureau are authorized in Chapters 1a, 1b, 2, 2a, Article 4 of Chapter 5, and Articles 1 and 2 of Chapter 8, Division 5, Agricultural Code.

Also enforced are the rules and regulations promulgated thereunder.

As an optional service to growers, supported by their fees, the bureau administers the seed potato certification inspection program to insure availability of disease-free seed potatoes.

Another self-supporting activity of the bureau is the canning tomato inspection service. The law requires that all loads of canning tomatoes meet certain quality standards before delivery by growers or acceptance by canners.

Standardization Enforcement

(Fruit, Nut, Vegetable, Honey and Egg Standards)

County agricultural commissioners, their deputies, and inspectors enforce these laws under the direction and supervision of this bureau. In 1957, county agricultural commissioners and their staffs worked 39,726 man days on fruit and vegetable standardization. Inspections were made of the equivalent of 330,235 carloads of fruits, nuts and vegetables, an increase of workload of 29 percent over the previous year. In a five-year period (1953-57) this is an increase in inspections of 73 percent. These inspections resulted in 11,239 rejections involving 947,906 packages, plus 2,255 tons of various fruits and vegetables. The number of packages and tons rejected in 1957 is an increase of 23 percent over 1956.

Fifty-six violators were cited to court, and 31 violators appeared at hearings to show cause why court action should not be taken against them. The total of prosecutions and citations increased 10 percent over the previous year.

Fruit and vegetable standardization inspection stations are maintained by the bureau at strategic locations on main highways. Loaded trucks from producing areas en route to large marketing centers are inspected.

At six such stations in 1957 there was an increase of 4.6 percent in volume of fruits and vegetables inspected over the previous year. The equivalent of 75,732 carloads of produce was checked at the several stations; each truckload either has a clearance certificate or is inspected at the station. The volume of fruits and vegetables checked by bureau employees at highway inspection stations has increased 20 percent since 1953.

There were 33 different kinds of fruits and vegetables checked at such stations. Of the total inspected, 37,543 packages of fruits and vegetables and 60 tons of melons were rejected. Table 1 shows the location, period of operation, and volume inspected at these stations.

TABLE 1

Station	Total packages	Est. total carloads ¹
Beaumont	16,283,226	32,566
Carpinteria	8,322,119	16,644
Castaic	6,098,492	12,197
Livermore	1,645,930	3,292
Pacheco Pass	2,449,133	4,898
Solemint	64,984	130
Total	34,863,884	69,727 ² 6,005 ³
		75,732

¹ Carload conversion figures of 500 packages used.
Watermelons—13 tons = carload.

² Fruits and vegetables.

³ Totals for watermelons are not included in the individual station totals, therefore the estimated total carloads of watermelons has been added to the overall total.

The Beaumont station was operated from January 1 to July 20 and from September 21 through December 31. Carpinteria station operated the entire year. Castaic was in operation from June 15 to September 14; Livermore from June 22 to September 14; Pacheco Pass from June 14 to September 14. Solemint was in operation for only three weeks from July 28 to August 17.

There were 63,516 lots of eggs inspected in 1957 by county agricultural commissioners and their staffs and members of the bureau, an increase of 14 percent in total inspections over the previous year and 15 percent during the five-year period (1953-1957).

In 1957 there were 570,901 cases inspected, a volume increase of 23 percent over the previous year.

The percentage of eggs rejected for failure to comply with the standards increased 38 percent in 1957 over 1956. Nearly half of the rejections was due to the presence of inedible eggs in the containers prepared for sale to consumers. Many eggs were rejected because they did not meet the quality grade as marked.

Poultry Meat Classification

A total of 19,044 inspections were made by county agricultural commissioners and bureau representatives in retail stores and poultry processing plants to determine compliance with the classification markings required by law to indicate to consumers the

use value of the poultry meat being purchased. Carcasses and packages of cut-up poultry meat inspected totaled 5,029,199 of which 287,651 units were rejected. Nine hundred fourteen violation notices were issued.

Seed Potato Certification

The purpose of seed potato certification is to assure California growers of a supply of disease-free stocks of potato seed which will produce more tons per acre of high quality commercial potatoes.

Inspection of potato plants in fields, and tubers being packed, were made in counties ranging from San Diego to Siskiyou. Varieties of potatoes certified in 1957 were: White Rose, 4,120 acres; Netted Gem, 967 acres; Pontiac, 138 acres; Kennebec, 338 acres, and Bliss Triumph, 1 acre; total 5,564 acres.

Six hundred twenty-four acres were withdrawn by growers, or rejected by bureau representatives after field inspections.

There has been a steady improvement in quality of certified seed potatoes since 1919, when the work began. In 1957, more than 90 percent of the certified seed potatoes passed the strictest inspection of foundation stock certified seed potatoes, as compared to 57 percent which passed foundation stock inspection in 1953.

Table 2 shows the acres of seed potatoes inspected by months for the first and second field inspections and the grading and tagging operation.

Two seed potato test plots were maintained. At Half Moon Bay, 382 samples, representing most of the seed sources used to produce certified seed, were grown and tested in the spring. At Oceanside, 392 samples, representing most of the certified fields were grown and tested in the winter.

Canning Tomato Standards

The Agricultural Code requires that every load of tomatoes delivered for canning purposes be inspected, and that a certificate be issued if the load meets the quality requirements. The objects of the law are to prevent delivery of unsuitable canning tomatoes, and to provide both the grower and the canner with the accurate percentage of defects in every load delivered.

In 1957, 2,083,800 tons of canning tomatoes were inspected and passed; 38,609 tons were inspected and rejected.



Senior Inspector Harry Yorston using a portable egg candler and scales to determine interior quality and individual egg weights

TABLE 2
**First and Second Field Inspections, and Grading and Tagging Inspections
By Acres and Months**

	Jan.-March acres	April-June acres	July-Sept. acres	Oct.-Dec. acres	Total acres
First field inspections	---	578	4,727	259	5,564
Second field inspections	---	62	3,221	1,657	4,940
Grading and tagging	1,809	341	288	1,871	4,309

During the period from 1953 to 1957 inclusive, the workload has increased 45 percent. Less total tons were inspected in 1957 than in the previous year, but the tons rejected increased 27 percent in 1957 over 1956. Generally, the quality of canning tomatoes grown in 1957 was not as good as in the previous year; because of this general lower quality, inspection was much more difficult.

During the peak of the season, 464 canning tomato inspectors were employed. Inspection was conducted at 153 inspection stations; 62 canneries, and 91 field assembly stations. Inspections began in the Imperial

Valley in June, and in the northern districts in July. Peak inspections were made in August, September and October, and were completed in December.

The workload increase is normally rapid. On August 17, inspections were made at the rate of 27,000 tons per week; three weeks later the rate was 175,000 tons per week. Soon after this point was reached, inspections jumped to more than 300,000 tons per week. Rain made inspections much more difficult than normal. The general quality of the canning tomatoes inspected was not as good as average.

Bureau of Markets

E. W. BRAUN, *Chief*

J. F. BENNETT, *Assistant Chief*

The activities of the Bureau of Markets during 1957 were similar to those of recent years, with the major portion of the time of the staff of the bureau devoted to the administration and enforcement of industry self-help marketing programs. A considerable portion of the bureau's activities, however, was devoted to conducting food trade marketing surveys, and providing general marketing service to the agricultural industries of California. During 1957 a number of agricultural groups requested information and assistance from the Bureau of Markets with respect to the formulation of marketing orders. None of the groups undertook formal procedures to actively put into effect a new marketing order. They may do so after further industry consideration.

The Bureau of Markets has direct responsibility for administering and enforcing the following chapters of Division 6 of the Agricultural Code:

- Chapter 1, General Marketing Service.
- Chapter 4, Nonprofit Co-operative Associations.
- Chapter 10, the California Marketing Act of 1937.
- Chapter 11, the Agricultural Producers Marketing Law.
- Chapter 12, the California Agricultural Products Marketing Law of 1937.
- Chapter 13, the California Agricultural Products Marketing Law of 1943.
- Chapter 18, the California Beef Council Law.

The bureau also has responsibility for the Processed Foodstuff Marketing Act.

Industry Self-help Marketing Programs

Industry self-help marketing programs are formulated by the industry concerned, and administered by an industry advisory board, with the department giving general assist-

ance and supervision in the administration of the program. All such programs are financed entirely by assessments which apply uniformly upon the commodities which are regulated by the programs. Expenses of carrying out these programs are borne by the industries and not by general tax funds. Each industry provides the funds necessary to defray the expenses of operation of its program. All expenditures are made in accordance with rules and regulations established to govern such expenditures. The department makes collections and expenditures on behalf of the various programs.

Each industry self-help marketing program is applicable to a single commodity on a uniform basis for producers or handlers or both producers and handlers, of the commodity, as the case may be. These programs provide for one or more of the following types of regulations or activities initiated to avoid or correct adverse marketing conditions:

1. Provisions for controlling the volume of the commodity which may be marketed, so as to balance supplies with reasonable market requirements.
2. Establishment of minimum grade, size, quality, condition or maturity specifications for the commodity, and provisions for uniform inspection and certification.
3. Provisions for advertising and sales promotion for the commodity, including measures to prevent, modify or eliminate trade barriers, and to develop new and expanded markets.
4. Provisions for carrying on research in current problems of production, processing and distribution of the commodity.
5. Provisions for control or prevention of unfair trade practices in the processing and handling of the commodity.

A total of 26 industry self-help programs were in active operation during 1957. The Marketing Order for Fresh Asparagus and the Marketing Order for Processing Asparagus were both inactive during 1957. The Marketing Order for Lemon Products was terminated effective September 30, 1957. The only activities conducted in 1957 under this marketing order were those relating to the liquidation of the affairs of the marketing order. Summary facts relating to the 26 programs in operation are:

Number of producers directly affected	36,003
Number of handlers	3,194

Producer value of products regulated	\$401,709,000
Total assessments collected	\$8,474,205
Expenditures for market expansion	\$4,987,241
Administration and enforcement	\$1,352,580
Inspection	\$1,146,327
Expenditures for research and survey projects	\$286,000
Miscellaneous (not classified) ...	\$607,000

Expenditures are less than collections. Unexpended balances may be carried forward to future seasons or may be refunded.

During its 1957 Session, the Legislature passed an amendment to the California Marketing Act (Chapter 1525, Statutes of 1957) which provides for investment by the State Treasurer of available balances of funds of the marketing programs that are on deposit for the account of the various programs. Proceeds from such investments are credited to the various programs in relation to balances in each account.

The programs in active operation during 1957 were applicable to the following commodities:

Early apples, bush berries, cantaloupes, dried figs, desert grapefruit, extracted honey, dry-pack lettuce, standard lima beans, canning olives, canning and freezing cling peaches, fresh peaches, fresh Bartlett pears, canning Bartlett pears, fresh Bartlett pear promotion, canning fall and winter pears, fresh fall and winter pears, Hardy pears, fresh plums, Delta white potatoes, Long White potatoes, poultry and turkey improvement, dried prunes, raisins, strawberries, turkey promotion, and wine.

Amendments

During 1957 four marketing orders were amended by major amendment procedures. The Marketing Order for Canning and Freezing Cling Peaches was amended and the term of the order was extended to June, 1960. The basic regulatory provisions of the marketing order remain the same as those contained in that marketing order which had a termination date of June, 1957. Details of operations were changed particularly with respect to inspection procedures.

The Marketing Order for Wine was amended to provide for a continuation to June of 1960. The regulatory authorizations in the amended marketing order are identical to those contained in the marketing order which would have terminated June 30, 1957.

The Marketing Order for Canning Fall and Winter Pears was amended to provide for termination in 1962. The existing marketing order had provided for termination in 1957. Authorizations in the marketing order with respect to regulatory features were unchanged.

The Marketing Order for Canning Olives was amended. Substantial changes were made. The existing marketing order had related only to processors and had provided authorization only for market stabilization through a withholding of the quantity which could be marketed. The amended marketing order involves producers as well as processors. Regulatory authorization included in the amendment permits grading and inspection as well as advertising and sales promotion in addition to the stabilization features.

During 1957 a public hearing was conducted to consider amendments to the Marketing Order for Long White Potatoes. The amendments considered at the public hearing related primarily to maturity standards. Upon review of the testimony received at the public hearing, a determination was made that further procedural steps would not be taken pursuant to the subject matter considered at the public hearing. An amended marketing order was not issued for written assent and the marketing order as it existed prior to the public hearing continues in effect unchanged.

During 1957 five marketing orders were amended by minor amendment. These amendments were operational in nature and covered administrative features of the programs. The programs amended related to cantaloupes, raisins, cling peaches, strawberries, and poultry and turkey improvement.

New Programs

One new marketing program was made effective in 1957. That program related to canned olives. In addition, a Marketing Program for Brussels Sprouts for Freezing was developed and submitted to the industry for its assent. The industry failed by a margin of less than 1 percent to approve of the marketing program. Therefore, the proposal did not become effective. In addition, a Proposed Marketing Order for Winter Head Lettuce was drafted and was considered at a public hearing held in January of 1957. After a review of the testimony at the hearing, it was determined that formal

proceedings in the formulation of this proposed marketing order should be discontinued.

Work was done by the bureau with numerous commodity groups in advising them of the provisions of marketing laws in relation to particular marketing problems of the commodity group. Possible programs have been discussed with the bureau in 1957 by representative commodity groups from the following list: olallie berries, wine vinegar, fresh market tomatoes, canning tomatoes, summer lettuce, Southern California eggs, sweet potatoes, freestone peaches for canning, fresh table grapes, cut flowers, broccoli for freezing and cauliflower for freezing. In addition, producer groups have worked with the bureau on a Marketing Order for Clingstone Peaches for Canning which would involve producers only.

Marketing Orders Terminated

The Marketing Order for Lemon Products was terminated effective September 30, 1957. The termination was based upon testimony and evidence received at public hearing which indicated that the marketing order had achieved the purposes for which it had been established and that continuing the marketing order in effect might tend to be disadvantageous to the lemon industry.

Referenda

In a producer referendum on the question of continuation, suspension or termination of the Marketing Program for Canning Bartlett Pears, more than 98 percent of the votes cast were for continuation of the program. Producers who participated in the referendum represented more than 40 percent of the producers in the industry.

New Fields of Activity

During 1957 advertising activities in foreign countries were carried out under marketing orders issued pursuant to California statute. Counterpart funds of the Foreign Agricultural Service of the United States Department of Agriculture were made available to both the prune and raisin industry during 1957. These funds were used for the promotion of prunes and raisins in foreign countries. The principal country in which advertising was conducted was the Federal Republic of Germany. A total of \$25,000 each was granted to the prune and raisin industries. The prune industry augmented

the Foreign Agricultural Service funds with \$40,000 from assessments collected pursuant to the Marketing Order for Prunes, and engaged in expanded activities in European markets. The Cling Peach Advisory Board has undertaken negotiations for the expenditure of moneys in Europe under a similar program.

Auditing

The Bureau of Markets makes administrative audits of the records of handlers of the commodities regulated by marketing programs to determine the status of collections in relation to assessments due. The policy of the bureau is to audit the records of all such handlers following the first year of operations of a marketing program. The extent of subsequent audits is determined from experience gained relative to the general accuracy of and compliance with assessment payments. Usually, audits are made each year of not less than 15 percent of the industry by number and volume. Investigative audits are made in all cases where there is reason to believe that underpayment may have occurred. The bureau also undertakes audits and reviews the activities conducted by the boards in the handling of its own administrative obligations. These audits review the administrative procedures followed by the board in accounting for employees' time and expenses, the property and equipment of the board and the procedural steps followed by the board in carrying out the marketing program. Auditors from the bureau prepare written reports of such audits and copies are provided to administrative personnel of the department and to administrative personnel of the board.

Advertising in foreign lands is a relatively new project of some advisory boards. This ad was prepared for use in Germany.

Translation: "KEEP YOUR MAN ON THE STRING WITH CONFECTIONERY"

A special treat at leisure hours—that's what your man likes. Why not try a cooky variety with CALIFORNIA PRUNES. They offer two advantages: These plump, sun-ripened fruits give confectioneries a delicious flavour and are also an ideal energy source. Their abundance of fruit sugar, vitamins and minerals are saved through dehydration methods only used in California. CALIFORNIA PRUNES are also a splendid match-mate with many other dishes. And they need not be soaked—they are cooked in 15-20 minutes.

Try this: AMERIKANISCHE COOKIES (recipe)



Mit Gebäck fängt man Männer...

Zu besinnlicher Stunde eine besondere Leckerei — das mögen die Herren der Schöpfung gern.

Machen Sie deshalb einmal ein Gebäck mit KALIFORNISCHEN TROCKENPFLAUMEN. Das hat zwei

Vorteile: Diese vollfleischigen, sonnengereiften Früchte machen jedes Gebäck zur Delikatesse und sind außerdem ideale Energiespender.

Ihr Reichtum an Fruchtzucker, Vitaminen und Mineralien wird durch die nur in Kalifornien übliche Art des Trocknens erhalten. KALIFORNISCHE TROCKEN-

PFLAUMEN sind auch eine köstliche Bereicherung für viele andere Gerichte. Und sie brauchen nicht eingeweicht zu werden —

in 15—20 Minuten sind sie gekocht.

Amerikanische Cookies

1 Eigelb, 1 Eßlöffel Zucker, 1 Prise Salz, 125 g Mehl, 4 Eßlöffel helles Bier, 1 Eiweiß, etwa 12 KALIFORNISCHE TROCKENPFLAUMEN, Ausbackfett, Zucker und Zimt zum Bestreuen
Eigelb, Zucker und Salz miteinander verrühren. Mehl und Bier abwechselnd hinzufügen. Zum Schluß das geschlagene Eiweiß unterheben. Die entkernten KALIFORNI-

Oder probieren

Sie einmal:

**Kalifornische
Trocken-Pflaumen**

schmecken immer
und zu allem

TROCKENPFLAUMEN
in den Teig rühren und sofort
in das heiße Fett geben. Nach
dem Ausbacken die fertigen
Cookies in Zimtzucker wenden
und warm zu Tisch bringen

Früchte aus dem sonnigen Land Kalifornien

Enforcement

Enforcement of the commodity marketing orders continued in a satisfactory manner during 1957. The centralization in Sacramento of all Bureau of Markets' noncompliance forms written by county and advisory board inspectors has enabled the bureau to maintain a uniform policy and to secure equitable action among its three enforcement offices in such widely separated and divergent-problem districts as Los Angeles, San Francisco, and Sacramento. Regarding bureau follow-through on red tags and noncompliances, this centralized control has also reduced enforcement costs to a minimum by facilitating a system of screening with advisory board managers which eliminates insignificant violations as an object of further investigation as well as to prevent duplication of effort on the more important cases. The use also by boards of fruit and vegetable standardization supervision as to inspection procedures and policies also continued to be advantageous to enforcement of quality provisions for several marketing orders.

Increased use was made of admonitory letters during 1957 as a method of enforcement. Experience has been very satisfactory in this regard as the records show that these letters have had a salutary effect in instances where the indicated violations are of a minor nature and are presumed to have occurred largely through inadvertence, carelessness, oversight, or negligence.

Delinquent assessment collections totaled just over \$176,000 for the year. Most significant of these was some \$64,500 of delinquent accounts collected for turkey promotion alone without a single formal complaint having been filed by the Attorney General's Office. This is in contrast to previous years when enforcement has been required to bring suit for the collection of numerous small debts under the Turkey Promotion Marketing Order.

During 1957, in cases where no other course could be taken but to refer the matter to the Attorney General's Office, penalty payments relating mostly to quality violations including the deceptive lot provisions under the Cling Peach Marketing Order in the total amount of approximately \$29,000 were settled either pursuant to court action or stipulated judgments. Out of 41 decisions rendered, only one, relative to an alleged deceptive lot of cling peaches was unfavorable to the State.

Important Legal Decisions

During 1957 one important legal decision was issued in connection with the *Paramount Citrus Association* case. In this case, the Superior Court in Los Angeles County had held that Paramount Citrus Association was in violation of volume control regulations of the Marketing Order for Lemon Products. The court had issued an order requiring Paramount to fulfill its surplus obligations and had assessed fines against Paramount for having failed to comply with the surplus obligations. An appellate court in Southern California had ruled that the law was not clear with respect to requiring Paramount Citrus Association to comply with the quantity regulations in addition to being assessed penalties. Upon appeal to the Supreme Court of the State of California, the Supreme Court by a four-three decision refused to review the decision of the appellate court. To correct the deficiency in the law, an amendment was enacted in 1957, making clear the authority of the court to require compliance in accordance with volume regulations and also to levy penalties for having failed to comply with volume regulations.

Beef Council Law

The California Beef Council Law established pursuant to Chapter 2241, Statutes of 1957, became effective in September, 1957. This law creates an agency known as the California Beef Council. The purpose of the council is to promote the sale and consumption of beef and beef products. The council consists of 19 members and 19 alternate members. Six of the members and alternate members represent range cattlemen, six members and alternate members represent cattle feeders and seven members and alternate members represent dairymen. The law provides that the members and their alternates shall be appointed by the Director of Agriculture from nominations made by the industry. Moneys to enable the council to carry out their purposes are obtained from assessments of 10 cents per head to be collected on cattle and calves inspected pursuant to the hide and brand inspection provisions of the Agricultural Code. Specifically exempted from provisions of the law are animals for reduction purposes, cattle transported for purposes other than sale or slaughter and without a change of ownership, any animal less than three months of

age and any animal sold for milk or calf production. Pursuant to the provisions of the law, nomination meetings were conducted throughout the State and from such nominations the director appointed the members and alternate members to the initial California Beef Council. Collection of moneys began November 1, 1957. Activities of the council during 1957 were primarily administrative in nature relating to the organization of the council, and the establishment of officers and employees. Promotion activities under the California Beef Council Law will begin in 1958.

The California Beef Council Law provides that any person who wishes to be exempted from the payment of the assessment for promotion purposes may be so exempted if he files with the Director of Agriculture a request for an exemption certificate. Exemptions expire June 30th, following the date of issue. New exemption certificates must be obtained by those desiring exemption for each new year. The exemption feature places a burden of uncertainty upon the council and those who support the program. The Beef Council Law provides that the law will terminate in 1963.

Food Trade Surveys

In 1957, the Bureau of Markets rendered service in the form of food trade surveys to the California long white potato, strawberry, bush berry, prune, canning Bartlett pear and fresh peach and plum industries. The surveys were conducted at industry request and the cost was paid from state funds matched with federal funds received from the U. S. Department of Agriculture. A survey comprises analyzing the marketing problems which face an industry and recommending specific steps for solving them. The developing of recommendations in turn comprises applying sound marketing principles, utilizing the results of previous studies and surveys, and obtaining from the food trade such additional information as is needed and feasible to obtain.

Long White Potato Industry

A survey undertaken last year was completed and the results were published in a report, "Expanding the Market for California Long White Potatoes." Copies of the report were distributed at industry expense to California producers and handlers of potatoes and other interested parties.

The report has helped growers and handlers to understand their marketing problems. Recommendations of the trade to improve and strengthen the operations of the Marketing Order for Long White Potatoes was received favorably by members of the industry in general. Notwithstanding the discouragement of unfavorable prices in 1957 the recommendations are being given careful consideration.

In discussing policies and plans, members of the advisory board have cited the report and a number of decisions of the board are in accord with the report. These include the decision to make the maturity requirements effective as early in the 1957 season as authorization permitted, and the decision to stress, in promotional work, the aim of popularizing the name "Long White" among the trade.

Strawberry Industry

A food trade survey was undertaken at the request of the California Strawberry Advisory Board to round out and bring up to date the information obtained in the course of surveys conducted for other industries in two previous years. The survey was conducted in September and October in 14 out-of-state markets. A verbal report of the findings has been given to the board's manager and promotional agency, and a written report is being prepared.

The fresh strawberry promotional campaign should be improved in order to have maximum effectiveness. Some of the promotional pieces should be changed in size and in layout. The material should be furnished to distributors in flexible assortments according to the needs of individual distributors rather than in uniform kits. Also, announcements of the materials should be made through direct mail as well as through trade papers and magazines. These findings are being considered in planning the 1958 fresh strawberry promotional campaign.

Commercial users of frozen strawberries regard the California pack as having an advantage in richer, more stable color, but disadvantages in comparatively low solid content and weak flavor. Retail distributors, on the other hand, regard the California pack as equal in quality to that of other states and superior in dependability of supply. The industry is taking these findings into account in planning its merchandising and promotional strategy.

Bush Berry Industry

The bureau granted the request of the Bush Berry Advisory Board for a food trade survey as a followup to one conducted in 1955, and a survey was conducted along with one for the strawberry industry. An oral report of the findings was given to the research and promotion committees of the board and to the board manager. A written report is under preparation.

Boysenberries have been used in the East much more extensively the past two years, during which there has been a blueberry shortage resulting from unfavorable weather conditions. Boysenberries have been used instead of blueberries, particularly in baked pies. The industry should anticipate that if the supply of blueberries again becomes normal, pie bakers generally may decrease the use of boysenberries and some, at least, will discontinue using them.

The use of boysenberries in frozen pie has expanded slightly. Obstacles to the distribution of frozen boysenberry pie include the practice of placing frozen pies flat in piles instead of on edge and the stocking of duplicate brands of a few fast selling kinds instead of a wider assortment of kinds.

Also there has been a slight expansion in the retail distribution of other boysenberry products and the restaurant serving of boysenberry dishes.

Survey recommendations for overcoming obstacles and expanding the market include research on the sales potential of boysenberry dishes and products and on ways of displaying products, wider furnishing of instructions to bakers on how to improve the quality of boysenberry pie, increased supplying of point-of-purchase sales aids to bakers and restaurants, and better informing of sales personnel on the quality and taste of boysenberries. Direct mail as well as trade magazines should be used as media for promoting boysenberries to commercial users and distributors.

Prune Industry

On request of the California Prune Advisory Board, a national survey on the merchandising of prunes was undertaken and completed during 1956. Findings and recommendations of the project were printed and distributed during December, 1956. The report received wide distribution. The original supply of 2,000 copies proved insufficient and an additional 1,000 copies were printed

at the request and expense of the prune industry. In addition, a condensed version of the report was carried in *Prune Program News*, a publication of the California Prune Advisory Board, and excerpts of the report comprised the advertising message of one of the major prune packers in a series of front-page articles of a leading industry news periodical.

Of greater significance than the distribution of the report has been its use. In line with survey recommendations, the Prune Advisory Board completely revamped its merchandising promotional program, and under the new program the survey report found continued use and application in the hands of merchandising representatives and retail organizations as an operations manual. Survey findings stimulated new ideas for promotional appeals which were used in the 1957-1958 promotional campaign. They gave impetus to plans for a consumer survey to discover additional selling approaches and to provide guidance for product research. The bureau assisted in the formulation of plans and outline for the consumer survey.

Canning Bartlett Pears

On request of the Program Committee for the Canning Bartlett Pear Industry, preliminary steps were taken early in 1957 toward the development of a survey to ascertain the effectiveness of the national program of canning Bartlett pear promotion. Preliminary investigations disclosed, however, that the Program Committee representing the California industry was involved with Oregon and Washington pear growers in the promotion of canning Bartlett pears, and that the undertaking of a survey on request of the California group alone was inadvisable. The preliminary investigation did uncover, nevertheless, a need for better communications among the co-operating groups and this finding was conveyed to the Pear Program Committee in oral form.

Fresh Peaches and Fresh Plums

On request of advisory boards for the fresh peach and fresh plum industries a survey was initiated in May, 1957, aimed at improving the effectiveness of the promotional program for these products within California. Fieldwork of the survey was conducted during July and August. Wholesalers, chain store executives, and the managers of over 200 retail stores representing

Southern California, the Central Coast District, and the Sacramento Valley were interviewed; retail displays were examined in detail; and consumer shopping habits were closely observed. While the written report of the survey is still in process, findings and tentative recommendations were presented orally to the advisory boards. These dealt primarily with peaches. The survey showed the peach industry was faced with three major issues: declining per capita consumption of product, decline in the purchase and use of the fresh product for home canning, and evolutionary changes in retail merchandising that are tending to shift the job of product promotion and merchandising back to the grower level. Findings indicate that unless industry initiates promotional action for the product it cannot expect much support from the food trade. Aggressive dealer service activities to encourage the adoption of better handling and displaying practices for the product, and strategically timed media appeals to stimulate co-operative retail advertising and consumer buying for fresh use were foremost among the recommendations to the industry.

General Marketing Service

Over the years the Bureau of Markets has served as a source of information and assistance to producers, processors, and distributors of California agricultural commodities

in connection with general marketing problems. The majority of the requests for this service is received from groups interested in the formulation of new co-operative marketing associations, or the development of new industry self-help marketing programs.

Also, numerous requests are received from individuals or groups seeking information or suggestions concerning general marketing problems, or desiring participation by bureau personnel in meetings of industry groups. Officials and industry groups in other states and in foreign countries frequently seek, by correspondence or personal visit, to obtain information about California marketing programs and the organization and operation of marketing agencies in California.

The general marketing service function of the Bureau of Markets has increased substantially during the past several years, particularly with respect to those commodity groups requesting information with respect to self-help marketing programs. The activities of the bureau in connection with such assistance are paid for from general fund sources to the time that the commodity group requests that a public hearing be held upon a marketing program. Once the formal procedural steps have been requested the commodity group is required to pay from its own moneys all of the costs of the department in connection therewith.

Bureau of Market Enforcement

J. C. HARLAN, *Chief*

H. S. CANN, *Assistant Chief*

Part I

Bureau of Market Enforcement, established in 1931, has the duty of enforcing the provisions of Chapters 6 and 9, Division 6, Agricultural Code, known as the Produce Dealers Act and the Processors Law.

These statutes were enacted to protect persons engaged in the production of farm products, with particular reference to the marketing of such products. Under these laws, handlers of farm products must be licensed and bonded in order to engage in the business of commission merchant, dealer or processor. Brokers, cash buyers and

agents also are required to obtain licenses but are not required to post bond.

Under the Produce Dealers Act, the agency exercises jurisdiction over persons who handle farm products on consignment or who purchase farm products in fresh form for distribution through wholesale channels. Practically all farm commodities are included under this act.

Commission merchants are required to post a \$5,000 surety bond, and by an enactment of the last Legislature the dealer's bond of \$1,000 was increased to \$2,000.

The Processors Law contains similar requirements for persons who purchase or

handle farm products for the purpose of manufacture or process, and who sell the finished product in dried, canned, frozen, extracted, distilled, fresh or other preserved form. Processors are required to post a \$5,000 surety bond.

Under these statutes, commission merchants are required to render true and proper accounts of sale and to make settlement thereon to the consignor. Dealers and processors are required to make payment to producers, in accordance with the terms of their contracts,¹ and as provided by law.

The work of the bureau involves investigations of complaints filed by producers against licensees, as well as a continuing supervision of agricultural and shipping centers to insure that persons engaged in handling farm products are properly licensed and bonded, and that general compliance with the statutes is maintained.

Controversies arising between producers and handlers are adjusted by the bureau with a minimum of expense to the parties involved.

Controls exercised by the bureau have made difficult the operation of unscrupulous handlers who not only attempt to defraud the producer but who also impose unfair competitive conditions upon those licensees who operate legally.

Hearings are held upon verified complaints filed by producers, and when a violation of the statute involved has been determined a licensee may be subjected to the suspension or revocation of license, or to the imposition of probationary terms and conditions.

The bureau maintains offices at Sacramento, Fresno, Los Angeles and San Francisco. Producers may file their complaints by telephone, telegraph, letter, or in person at any of these offices. Adjustments and settlements of controversies generally are secured either by investigation or informal conference.

The bureau is supported and maintained by license fees. No charge is made for the various services performed for producers.

During 1957, the bureau recovered for producers under the Produce Dealers Act \$307,701.08, in which 552 producers participated. Under the Processors Law, recoveries amounted to \$89,065.02 in which 91 producers participated. The total amount involved under both statutes was \$396,766.10, in which 643 producers participated.

Part II—Details of Functional Activities

Produce Dealers Act—Summary of Complaints Handled, 1957

On January 1, 1957, open complaints totaled 225. During the year, 19 complaints were reopened, 1,085 new complaints were received, and 750 complaints closed, leaving 354 complaints open as of January 1, 1958. One hundred thirteen administrative hearings were held, disciplinary action resulted in 17 licenses revoked, 20 licenses suspended, and 19 applications refused and denied.

Forty-one criminal prosecutions of unlicensed dealers resulted in five jail sentences served, 16 fines assessed, and 10 suspended sentences and probation granted.

The sum of \$307,701.08 was recovered for 552 complainants during the year.

Processors Law

On January 1, 1957, open complaints totaled 64. During the year, 103 complaints were received and 112 were closed, leaving 55 complaints open on January 1, 1958. Administrative hearings totaled 21; one license was revoked, two were suspended, and three applications refused and denied.

The sum of \$89,065.02 was recovered for 91 complainants during the year.

As a summary of all activities under both laws, 289 complaints were open on January 1, 1957; 1,188 new complaints were received and 19 were reopened; 862 were closed, leaving 634 complaints open on January 1, 1958. The sum of \$396,766.10 was recovered for 643 complainants; of this amount, \$58,107.49 was recovered as the result of 38 demands made on the bonds of dealers, commission merchants, and processors.

The bureau issued 14,523 licenses; 12,095 under the Produce Dealers Act to dealers, brokers, commission merchants, cash buyers, and agents, and 2,428 to processors and agents. On these licenses, administrative hearings were held in 134 cases, resulting in 18 revocations, 22 suspensions, and 22 denials of applications.

A condensed summary of the activities of the bureau in the administration of the regulatory statutes assigned to it for a 31-year period, 1927 to 1957 inclusive: 23,368 complaints handled, 4,119 administrative hearings held, 749 licenses revoked, 588 licenses denied, and 1,133 criminal prosecutions. As a net result of all activities, the bureau, during the 31-year period, recovered for growers a total of \$13,144,700.

Bureau of Market News

MAX K. JOHNSON, *Chief*

B. G. HILLIS, *Assistant Chief*

The Bureau of Market News is a service agency of the department. Authority for operation of the bureau is contained in Sections 1152 and 1153 of Chapter 1, Division 6, Agricultural Code.

The function of the Bureau of Market News is to collect and disseminate impartial, accurate, useful, and timely information for the benefit of all persons engaged in the State's agriculture. Market News information is used as an aid to efficient, orderly, and intelligent marketing of the products of California's farms.

California's Market News program is carried on under a co-operative agreement between the California Department of Agriculture and the United States Department of Agriculture under the operating title, Federal-State Market News Service.

The service reports on fresh market fruits and vegetables; hay, grain, feeds, and beans; livestock and meats; dairy products, poultry, and eggs; and miscellaneous commodities including dried fruits, honey, and wine. Major California commodities not reported by the bureau include cotton, nuts, and most processing items.

Upon industry request, the 1957 Legislature provided funds for three major Market News expansions and for two new projects.

The major expansions included establishment of daily reporting of hay markets in the Imperial Valley; extension of Los Angeles area hay market reporting to include the Chino-Ontario area; and expansion of the vegetable reporting program at Salinas to include seasonal reporting of celery and minor vegetables.

The new projects included establishment of a hay and grain reporting office at Fresno for the central and southern San Joaquin Valley area; and establishment of a seasonal grape reporting office in the Coachella Valley. Except for the Coachella grape reporting program, which will begin with harvest of the 1958 crop, all of these expanded or new services were started during the latter half of 1957.

Dairy and Poultry Products

Dairy products prices averaged slightly above 1956. Prices again largely reflected governmental support prices for butter, cheese, and dry milk solids. Poultry products prices, reflecting abundant supplies, averaged below 1956. National production was at record levels on poultry and turkeys, and California production reached record levels on eggs and turkeys. Producers again had difficulty selling poultry products at profitable prices.

Butter and Cheese

Butter and cheese prices, largely determined by U. S. D. A. support prices as in recent years, averaged slightly above 1956. California production, short of needs, was supplemented by shipments from other areas. California fluid milk production was the highest of record. Butter production increased during the last half of the year as a result of the diversion of manufacturing milk normally used by evaporators.

Turkeys

Turkey prices were the lowest since 1941. San Joaquin Valley prices averaged 5-6 cents below 1956, and 7-9 cents below the 1952-56 average. Stimulated by low advertised prices and relatively high red meat prices, movement of processed turkeys into consumer channels was unusually heavy during the holidays.

Record turkey crops plus heavy cold storage stocks resulted in burdensome supplies during most of 1957. Production was 5 percent above the 1956 record in the United States and 15 percent above in California, the Nation's leading state. In the San Joaquin Valley, California's major producing area, turkey processing plants slaughtered more than 8,500,000 birds, up 1,000,000 from 1956.

Fryers

Fryer prices averaged fractionally below 1956 and were the lowest in 16 years. Vertical integration increased. Most fryers were

grown under some form of price or profit guarantee by feed, hatching, or processing concerns or a combination of such concerns.



Fresno poultry buyer Douglas Leith (left) reports a purchase of hens to Bureau Marketing Specialist Donald Lockhart. Poultry sales prices are included in the daily Dairy and Poultry Market Reports issued at Fresno, San Francisco, Los Angeles, and other trading centers of the Nation.

Fryer production in the United States was at a new record high, with placements 6 percent above 1956. Fryer production in California was 16 percent below 1956. Out-of-state ice-packed fryers moved into California in increasing volume, discouraging production here. Some processors-distributors closed their terminal market plants and obtained supplies from processors in out-of-state or California producing areas. Direct procurement of processed poultry by large retail outlets continued to increase.

Hens

Prices for light type hens averaged $2\frac{1}{2}$ -3 cents below 1956. Supplies were plentiful. Demand was active at the relatively low prices, particularly from canners and food manufacturers. Prices for heavy type hens averaged 3-4 cents below 1956, due to decreased demand. Supplies were light reflecting the decreased use of colored hens for layers and for breeding purposes.

Eggs

Monthly price averages for California eggs ranged from 13 cents below to 8 cents above 1956. During the first half of the year, prices were especially low, tending to dis-

courage flock replacement. As a result, fall and winter production decreased. In the last half of the year prices advanced. For the year as a whole, price averages ranged 2-5 cents below 1956.

California egg production was the heaviest of record, but the national volume was slightly below the 1956 record high. The State continued to import supplies from other states and Canada to supplement local production though the Los Angeles area continued to produce a surplus during most of the year and moved many eggs to other terminal markets.

Livestock and Meats

Prices for all classes of livestock were featured by a strong finish in the last quarter of 1957. Price trends followed a fairly standard pattern early in the year but advancing prices at the close represented a significant deviation from normal. Market strength at the end of the year may be attributed to diminished supplies available for slaughter, reduced inshipments, and a fairly stable consumer demand for the dressed product at retail outlets.

Slaughter Cattle

Choice steer prices in direct trading in California were lowest in January; advanced



One of the services rendered by the Market News Reporter at the Dixon Livestock Auction is to provide current livestock market reports. Here, Market News Reporter E. J. Mason (right) is discussing market reports with Irwin Swanson, stockman from Alturas, California. Daily market reports received by teletype are posted at the Dixon Livestock Auction.

unevenly to a peak in July; receded during the remainder of the third quarter; then reversed direction and reached their highest point at the close of the year. Prices closed approximately \$5 per cwt. above a year earlier.

Slaughter cows were in good demand throughout the year. The abundance of pasture in previously drought stricken areas permitted farmers to retain many of their cows for stock and breeding purposes. Offerings for slaughter were reduced and prices generally averaged well above a year earlier. In the last four months of 1957, slaughter cows at Stockton averaged \$2.50-4.50 above the comparable period in 1956.

Replacement Cattle

Ample range grass in stocker and feeder producing areas likewise gave producers a price leverage. California livestock men met brisk competition for stocker and feeder cattle from midwestern producers who had abundant supplies of low cost feeds. Inshipments of replacement cattle from the intermountain territory were the lowest in several years and prices were considerably above 1956. From May through October, monthly average prices for Choice 500-800 pound stocker and feeder steers at Stockton ranged \$2.10-3.10 above the same months in 1956. November and December prices averaged \$4.75 and \$5.96 respectively above the same months a year earlier. The December average was \$23.91.

Lambs

Weather again was the most important factor affecting the trend of prices for early California spring lambs. Contracting opened in March on an optimistic note, reflecting favorable range feed prospects. Early transactions included nearly 150,000 head at \$23-24, about \$4 per cwt. above first contracts in 1956.

As the season advanced, pastures deteriorated, carrying capacities declined, and out-of-state demand diminished for both live and dressed lambs. Total out-of-state movement during the early spring lamb marketing period was well below 1956. Prices declined and closed on late Sacramento Valley offerings at \$22-22.75 for mostly Choice slaughter lambs and \$21.50-22 for Good and Choice mixed fat and feeder lambs, or about 50-75 cents per cwt. above late contracts in 1956.

Receipts of lambs at South San Francisco, California's largest terminal market for lambs, were above 1956. Prices for Choice and Prime slaughter spring lambs were similar to a year earlier, during heaviest marketing from April to September, but the differential widened and woolled slaughter lambs closed \$2.50 above 1956.

Hogs

California, a deficit state in the production of hogs and pork, depends on supplies from midwestern states. Inshipments of live hogs were below 1956. Nebraska supplied the greater part. A substantial, but unrecorded, quantity of dressed hogs also is imported from the Midwest.

At California's three terminal markets, South San Francisco, Stockton, and Los Angeles, salable hog receipts were below 1956. Monthly average prices for barrows and gilts were consistently above a year earlier with the differential widest in January and narrowest in December. The 1957 average price for 200-220 pound barrows and gilts at Los Angeles was \$3.45 per cwt. above the previous year.

Meats

Carcass steer and heifer beef prices were mostly above 1956, except during September and October. Choice steer carcasses, 600-700 pounds, averaged \$38.72 per cwt. at San Francisco, \$3.05 above 1956. Pork loin prices receded in the first quarter; were on the upswing in the second quarter; crested in the third quarter; and gradually declined in the last quarter. Fresh pork loins, 10-12 pounds, averaged \$52.65 per cwt., \$1.66 above the previous year. Smoked, skinned, 12-16 pound hams averaged \$54.80 per cwt., \$1.98 above 1956. Lamb carcasses during the spring lamb season, April-December, averaged \$43.60 per cwt., 56 cents above the previous year.

Hay, Grain and Feeds

Market prices for California hay, grain, and feed commodities showed mixed changes from 1956. Prices for alfalfa hay averaged above 1956 in the southern half of the State but below in the northern half. Barley, corn, milo, oats, and most feedstuffs averaged below 1956, largely as a result of increased production and lower government support rates. Prices for hops, rice, wheat, and dry beans averaged above a year earlier. The

higher prices largely reflected decreased production.

Alfalfa

Alfalfa prices statewide averaged about the same as the previous year. Prices averaged about \$1 per ton above 1956 at Los Angeles but \$1 below at Petaluma. Though total hay supply moderately exceeded demand, most producers held firmly for going market prices or higher.

As the year closed, the tonnage of hay on California farms was 3½ percent more than at the beginning. Although production was down a trifle, a large carryover of old crop and substantial inshipments of relatively low priced but good quality alfalfa from Nevada swelled the total supply.

On the demand side, the principal strengthening factor was an increase of 19,000 in the number of cows kept for milk. Demand weakening factors included more abundant pasture and range feed than normal; a considerable drop in number of beef cattle on feed; and a decline in feed grain prices to historically low levels.

Barley

Barley prices dropped to their lowest levels since 1945, reflecting huge supplies, slackened demand, price declines in other feed grains, and reduced support prices. Prices for feed barley averaged 5 percent below 1956 at San Francisco and 3 percent below at Los Angeles. The crop was the largest in the State's history and made California the Nation's leading barley producing state for the year. Usage by California feeders and feed manufacturers, the most important outlets, decreased due to better than average pasture conditions and a moderate shift from barley to corn and milo selling at low prices.

Export demand for California barley decreased as lower priced offerings were available from the Pacific Northwest and other areas. Local malting usage continued its downward trend. West Coast maltsters took the smallest quantity of California-grown barley since 1938-39.

Corn

Corn prices averaged the lowest since 1944. Market weakness reflected the record state and national production. At San Francisco, monthly average prices for California corn were highest in January; lowest in Sep-

tember; then edged upward at the close. Usage of California corn by feeders and feed manufacturers was above 1956. California corn dominated the San Francisco market throughout the year and captured an increased share of the Los Angeles market.

Milo

Milo prices also averaged the lowest since 1944. Record California and national supplies contributed to market weakness. Low prices encouraged heavy usage by feeders and feed manufacturers. Severe competition for middlewestern and southwestern supplies virtually excluded California milo from the Los Angeles market, but California production predominated at San Francisco. Monthly average prices for California milo at San Francisco were highest in February; declined to the lowest point in October; then advanced slightly at the close of the year.

Rice

Rough rice markets were active for the independent tonnage immediately following harvest. A large part of this independent tonnage sold quickly on an advancing market. The largest share of the crop, however, was marketed through co-operatives. Demand from mills slackened and trading slowed when prices for milled rice failed to advance also. Trading continued slow the remainder of the year. Prices for rough rice averaged only slightly above 1956 though the crop was 23 percent below 1956 and the smallest since 1950. Only a small quantity of rice was placed under government support due to the small crop and active early trading.

Wheat

Wheat prices averaged moderately above 1956 and slightly above 1955. Higher prices were largely a result of decreased production. California production was 25 percent below 1956 while national production was slightly below. Prices averaged highest in April and May when old crop offerings were light and trading unusually active in 1957 crop for future delivery, and lowest in July, though changes were small. California's 1957 crop was the smallest since 1924 as a result of Soil Bank participation and acreage restrictions.

Beans

Price trends were mixed for 1956 crop California dry beans sold in the first part of



Warehouseman Harry Cox (left) and Marketing Specialist Wendell Stoker of the bureau's Sacramento office discuss dry bean prices at the grower level. Prices to growers are carried on the Los Angeles and San Francisco weekly Bean Market Reviews.

1957. Small Whites, California Reds, and Red Kidneys advanced; Large Limas, Baby Limas, Blackeyes, and Pintos fluctuated or were little changed; and Pinks and Cranberries declined. Price trends were upward for 1957 crop sold during September to December, and prices for all varieties and qualities combined averaged slightly above 1956.

Demand during the year was slow to moderate. Trading was mostly on a "hand-to-mouth" basis for nearby needs of dealers and distributors. Rains at harvest time caused some loss of production and lowered quality.

Feedstuffs

Feedstuff prices were lower for the year, with several items reaching their lowest annual averages since 1945. Market values for feedstuffs were forced downward by generally abundant supplies, good pastures from April onward, and low prices of feed grains.

Fresh Fruits and Vegetables

Marketings of California fruits and vegetables for fresh market consumption appeared about equal to or very slightly above 1956. Rail and boat shipments totaled 250,621 cars, nearly all of which moved to out-of-state markets. This State originated 44 percent of the Nation's rail shipments of 573,767 cars, the other 47 states only 56 percent. California rail shipments were 4 percent below 1956 and national shipments 10

percent below, in continuation of a downward trend. California outbound truck shipments increased another 12 percent to 85,995 carlot equivalents, representing 26 percent of California's total outbound movement. Comparable truck shipment data are not recorded for the United States as a whole.

A large part of California's fresh market fruits and vegetables is consumed within the State. Unloads of California produce at Los Angeles, San Francisco, and Oakland were equivalent to 133,554 carloads, 5 percent above 1956. They represent 78 percent of the total unloads at those markets. Unloads are not recorded at other California points. An important but unrecorded proportion of California's outbound truck shipments represent reshipments from the terminal markets.

Los Angeles, with 129,913 carloads of fruits and vegetables received from all sources, was second only to New York in total unloads. The San Francisco Bay area, with 41,219 carloads, was the Nation's sixth largest market.

Prices on the Los Angeles and San Francisco wholesale markets averaged below 1956. Some commodities were higher but more were lower, including some major volume items. Types and sizes of containers and packages continued to change, with emphasis toward smaller content and lighter weight.

Market developments for a few of the more important items follow:

Celery

The Nation relies on California for most of its celery. This State ships celery to market every month of the year from a half dozen major producing districts. California rail shipments of 18,610 cars were 6 percent below 1956, yet represented 71 percent of the national total of 26,165 cars. An additional 7,119 carlot equivalents moved to out-of-state markets by truck. Truck unloads of California celery at Los Angeles and Bay area markets totaled 10,359 carlot equivalents. Prices varied by district but averaged well above 1956.

Chula Vista growers and shippers had a profitable season. Demand was widespread and shipping point prices most of the season were nearly double a year earlier. The Venice-Oxnard-Orange County district season was similarly profitable though demand and prices varied.

Salinas-Watsonville was plagued with extremely low prices and prolonged periods of dull trading. Except for short periods, the season was discouraging. Rail shipments 40 percent above 1956 indicated the growing importance of this district.

The Stockton Delta district season was poor though prices advanced as the season progressed. Santa Maria-Guadalupe-Oceano had a profitable year, especially during June. This district boasts the longest shipping season in the Country, harvesting continuing almost year around.

Cantaloups

California cantaloup prices averaged well above 1956, reflecting a good demand and active trading. California rail shipments of 14,059 cars were 9 percent above 1956 and represented 70 percent of the national total of 20,175 cars. Trucks moved 3,148 carlot equivalents to out-of-state markets and 3,626 carlot equivalents to the San Francisco Bay area and Los Angeles.

Potatoes

Depressed prices established record low net returns for Kern district Long White potatoes in sharp contrast to the highly profitable 1956 season. Total national supplies of potatoes were well above trade requirements because of increased acreage both locally and in competing late spring producing areas and a large carryover of old crop potatoes. Prices showed some improvement on the later deals.

Lettuce

Lettuce prices averaged well above a year earlier during the winter and summer seasons while during the spring and fall seasons they averaged moderately below.

Trading levels were profitable the first half of the Imperial Valley winter season but were near packing and harvesting costs the last half.

Lettuce is marketed from the Salinas-Watsonville district from April to November.

Spring and fall lettuce seasons were unsatisfactory largely as a result of slow demand and slow movement in terminal markets. Good quality lettuce suitable for shipment to eastern markets generally was scarce. The summer lettuce season was very successful.

Lettuce production was greatly increased in the Brentwood-Patterson district follow-

ing the highly profitable 1956 season. The Market News Service expanded its reporting program to include shipping point price quotations for this district. Growers found this season far less profitable than 1956, but still considered it satisfactory.

Strawberries

The record large crop of California strawberries was beset with marketing difficulties. A record national crop and a heavy carry-over of frozen berries depressed the market. Rains during peak spring harvest lowered quality and caused considerable loss of fruit. Prices for fresh market berries were lower than in most recent years. Prices for berries going to processors were the lowest of record. Rail shipments totaled 2,461 cars, the heaviest of record, and trucks moved another 904 carlot equivalents to out-of-state markets and 1,930 carlot equivalents to Los Angeles and San Francisco Bay area markets. Nearly 107 million pounds were processed, principally frozen.

Citrus Fruits

Prices for California citrus fruits in the 1956-57 season averaged below 1955-56. Production of Navel oranges and lemons was well above 1956-57, while production of Valencia oranges and grapefruit was below. Out-of-state markets received 62,529 carloads by rail and truck, 12 percent below 1956. Los Angeles, San Francisco, and Oakland received the equivalent of 8,471 carloads of California citrus by truck, 1 percent below 1956.

Deciduous Fruits

Eastern auction markets continued a major outlet for California deciduous fruits sold for fresh market consumption. Apricot sales at auction were equivalent to 97 percent of the interstate rail shipments, nectarines 78 percent, cherries 76 percent, plums 55 percent, and pears 44 percent; but peaches only 16 percent. Auction prices for California apricots, cherries, and nectarines were below 1956; while peaches, pears, and plums were above. Shipping point prices for California nectarines averaged lower but peaches and plums averaged higher.

Grapes, Raisins, and Wine

Overall prices received by growers for 1957 crop grapes averaged the highest since 1950, reflecting comparatively small total supplies. Competition was strong from the

different outlets. Rail and truck out-of-state shipments to fresh markets through December 31st were equivalent to 18,084 carloads, 4 percent below 1956. Shipping point prices for table varieties compared favorably with 1956 for fresh packed supplies, but were lower for most storage stocks.

Prices to growers for raisins averaged the highest since 1950. Thompson Seedless, the major variety, ranged \$235 per ton early to \$290-305 at the close. Field trading was marked by the high prices, the absence of trading restrictions, substantially lighter supplies, and a rapid commitment of the crop.

Wineries paid growers mostly \$10-15 per ton above 1956 and the highest prices since 1950. The crop was smaller than average, wine had been moving well, and inventories were below normal. Wineries competed not only with each other for supplies, but with raisin packers as well. The total crush approximated 1,195,000 tons, about 60,000 below 1956.

The bulk dessert wine market held at 55 cents per gallon through August. The market advanced to 70 cents in September, the highest level since June, 1951. After holding almost unchanged for several years, the table wine market closed 1957 unchanged to 5 cents per gallon higher.

Dried Fruits

Prices received by growers for 1957 crop dried prunes averaged the lowest since 1951. Prices were mostly below 1956 on sizes constituting the bulk of the crop but above on largest and smallest sizes. Available supplies exceeded anticipated trade needs, and 10 percent of the standard quality prunes were withheld from the market under the provisions of the Federal Marketing Agreement and Order.

Packer demand was good. Grower selling was later than usual and principally on other than firm price contracts.

Dried apricot prices to growers averaged about 10 cents per pound below 1956 and the lowest since 1951. Widespread canner buying contributed to a reduced dried output 17 percent below 1956. Demand was good for dried apricots and the market strengthened as trading progressed. Packers paid growers 35-40 cents per pound for most of the better quality lots.

Dried peach prices to growers averaged about 5 cents per pound below 1956 and the lowest since 1951. The quantity dried was 6 percent above 1956. Packer demand was good for the moderate tonnage. Packers paid growers 18-20 cents per pound for most lots.

Bureau of Milk Control

D. A. WEINLAND, *Chief*

W. J. HUNT, JR., *Assistant Chief*

The Bureau of Milk Control administers and enforces the provisions of Chapters 14, 15, 16, and 17, of Division 6 of the Agricultural Code of California.

Chapter 14, the California Dairy Industry Advisory Board Act, enables the dairy industry to develop, maintain, and expand its markets through sales stimulation, research, and educational programs. The act provides for a fee to be paid by all producers and handlers of milk in California. The bureau collects the fees, and supervises the expenditure of the funds. The bureau also conducts the meetings required by statute to receive nominations for membership on the board that formulates and carries out the programs.

Chapter 15, the Produce Exchange Act, provides for the licensing and regulation of dairy produce exchanges. The act also provides for the suspension or revocation of the licenses issued in the event of certain misconduct. The bureau is responsible for making the investigation upon receipt of any verified complaint charging misconduct.

Chapter 16, the Ice Cream Law, regulates the business activities of dairy products distributors. This statute defines and prohibits certain unfair practices, and provides for the establishment of rules and regulations. It further requires the establishment of minimum rental rates for refrigeration equipment for frozen products supplied by a distributor to a customer. The bureau con-

TABLE 1
Estimated Sales per Capita of Fluid Milk in California, 1950-1957

Year	Estimated population, July 1 ¹ (thousands)	Total sales of fluid milk		Sales per capita (quarts)
		Thousand gallons	Thousand quarts	
1950	10,609	330,741	1,322,964	124.7
1951	11,058	352,817	1,411,268	127.6
1952	11,743	375,564	1,502,256	127.9
1953	12,168	389,028	1,556,112	127.9
1954	12,595	398,069	1,592,276	126.4
1955	13,035	424,621	1,698,484	130.3
1956	13,600	458,346	1,833,384	134.8
1957*	14,160	482,180	1,928,720	136.2

¹ California Department of Finance.

* Preliminary estimates.

ducts the surveys required to establish minimum refrigeration rentals, and enforces all provisions of this act.

Chapter 17, the Milk Control Law, provides for the establishment of minimum producer prices and minimum wholesale and minimum retail prices for fluid milk. It also provides for the licensing and bonding of distributors, and the formation of sales stimulation programs by marketing areas.

Among the 1957 legislative changes which affect the administration of Chapters 16 and 17 are the following:

1. The legislative standards relating to the establishment of minimum prices to producers were revised to permit more latitude in evaluating the proper relationship to manufacturing milk prices.

2. Chapter 17 was amended so as to provide permissive authorization to fix minimum resale prices for fluid skim milk.

3. Chapter 17 was amended so as to permit the establishment of resale pricing zones within a single marketing area.

4. The definition of dairy products under Chapter 16 was amended to include butter, American or cheddar cheese, Monterey jack cheese, and pasteurized processed cheese.

5. The sale by manufacturers, distributors and retail stores of milk, cream, and dairy products, which now include butter, Amer-

ican or cheddar cheese, Monterey jack cheese, and pasteurized processed cheese, at less than cost was declared an unfair practice, and cost was expressly defined.

Between 1956 and 1957, the production of market milk fat in California increased nearly 11 percent, and Class 1 usage increased about 4½ percent. In 1956, approximately 12 percent of the market milk fat produced in this State was in excess of Class 1 requirements; in 1957, about 17 percent.

During the past year, both the production and Class 1 usage of market skim milk in California increased more than the comparable figures for market milk fat. This development reflects an extension of the downward trend in the average milk-fat content of the market milk produced and used in fluid market milk products in this State; this trend has been in evidence during recent years.

Approximately 482,000,000 gallons of fluid milk were sold in California during 1957, equivalent to more than 136 quarts per person in the resident population, establishing a new record for sales per capita. Since 1954, sales of fluid milk per capita in California have increased approximately 10 quarts, or nearly 8 percent.

Between 1956 and 1957, the population of California increased about 4.1 percent. Sales

TABLE 2
Sales of Class 1 Fluid Market Milk Products, Other Than Fluid Milk, in California, 1950-1957 (Thousand Gallons)

Year	Fluid skim milk	Flavored milk drink	Half- and-half	Fluid cream
1950	7,394	6,240	15,267	3,755
1951	9,673	6,803	15,398	3,463
1952	11,111	7,351	15,706	3,384
1953	12,314	7,498	15,822	3,288
1954	13,960	7,225	15,641	3,246
1955	16,460	7,895	16,183	3,347
1956	19,886	8,209	16,515	3,367
1957 *	23,644	8,603	16,449	3,421

* Preliminary estimates.

of fluid milk increased 5.2 percent; sales of fluid skim milk, 18.9 percent; sales of flavored milk drink, 4.8 percent, and sales of fluid cream 1.6 percent. Sales of half-and-half during 1957 were 0.4 percent less than during 1956.

During 1957, the bureau held 56 public hearings, 15 for the purpose of considering amendments to stabilization and marketing plans, 34 for the purpose of considering amendments to minimum wholesale and minimum retail prices for fluid milk, four for the purpose of considering proposals for establishment of minimum wholesale and minimum retail prices for fluid cream and fluid nonfat milk, one for the purpose of considering changes in boundaries of a marketing area, and two for the purpose of considering consolidation of marketing areas.

As a result of information obtained at six consolidated producer hearings covering 30 marketing areas, the automatic seasonal drop in minimum producer prices for fluid milk, scheduled for April 1, 1957, was delayed until May 1st.

The seasonal price provision in the stabilization and marketing plans automatically decreases the producer price the equivalent of 1 cent per quart in Northern California marketing areas, effective April 1st of each

year, and increases the price the equivalent of 1 cent per quart, effective September 1st of each year. In most of the Southern California marketing areas, under the automatic seasonal drop plan the minimum producer prices decrease the equivalent of one-half cent per quart effective April 1st, and increase one-half cent per quart September 1st of each year.

Minimum Class 1 prices were amended in two marketing areas as the result of information obtained at three public hearings.

The boundary of one marketing area was modified, and two marketing areas were consolidated into one area as the result of three public hearings.

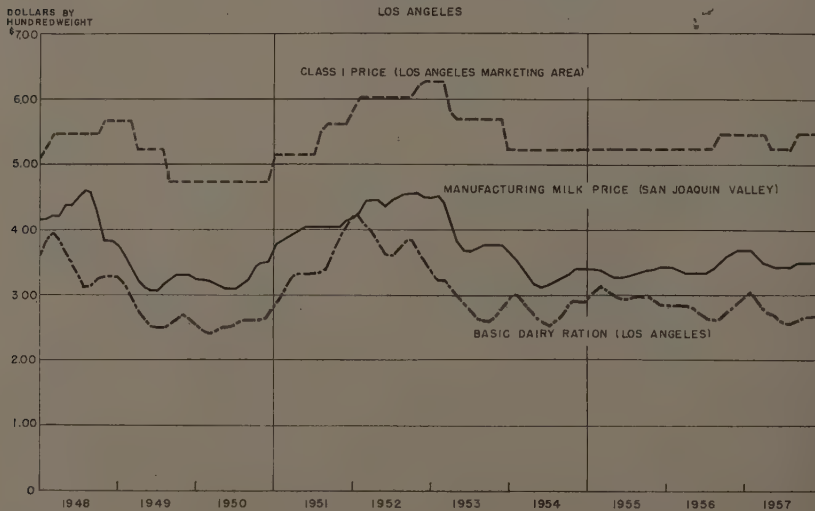
Following six public hearings covering 13 marketing areas, stabilization and marketing plans were amended to bring those plans into conformity with amendments to the Agricultural Code as enacted by the 1957 Session of the Legislature. The plans were amended to permit fluid milk distributors to pool, for producer payment purposes, any fluid milk purchased from producers which is diverted directly to a manufacturing plant for manufacturing purposes. This change will provide economy in transportation both to producers and distributors.

Generally, the prices paid to California producers for fluid milk going into Class 1

COMPARISON OF MARKET AND MANUFACTURING MILK PRICES F.O.B. PLANT WITH COST OF BASIC DAIRY RATION

1948-1957 (PER HUNDREDWEIGHT 3.8% MILKFAT)

LOS ANGELES



usage during 1957 averaged slightly higher than the prices a year ago. The manufacturing grade milk prices paid to producers during the first seven months of 1957 averaged higher than a year earlier, but a general weakening in paying prices to producers in major milk producing states was reflected in California prices during the latter part of the year.

In general, minimum consumer prices for fluid milk have increased in the marketing areas where the '34 resale price hearings were held. The increases in prices were due to increases in the cost of labor and supplies used in processing and distributing fluid milk. However, increased efficiency in the processing and distribution of milk resulting from quantity discounts and increased sales has acted as an offset to some increases in costs. Consumers purchasing milk in California are in a favorable position relative to the remainder of the United States.

Table 3 shows a comparison of retail milk prices between California cities and cities throughout the United States.

TABLE 3

Average Retail Prices of Fluid Milk Sold at Grocery Stores and Delivered to Homes, 20 Cities, United States, May and October, 1957

(Cents per quart)

	Home-delivered	Grocery stores
New York, N. Y.—N. E. N. J.	28.7	25.9
Boston, Mass.	28.3	25.9
Chicago, Ill.	28.0	22.0
Philadelphia, Pa.	27.5	27.7
Scranton, Pa.	27.5	26.8
Washington, D. C.	27.5	24.9
Atlanta, Ga.	27.0	27.0
Pittsburgh, Pa.	26.8	25.9
Cincinnati, Ohio	26.5	24.2
Houston, Texas	26.0	22.9
Baltimore, Md.	25.5	25.0
Portland, Ore.	25.0	22.7
Seattle, Wash.	24.5	23.3
Detroit, Mich.	23.9	22.0
SAN FRANCISCO, CALIF.	23.8	22.6
LOS ANGELES, CALIF.	23.1	21.1
Kansas City, Mo.	22.8	20.6
St. Louis, Mo.	22.5	20.2
Cleveland, Ohio	21.8	19.1
Minneapolis-St. Paul, Minn.	18.8	18.4
20-City average	25.3	23.4
United States, 41-city average ...	25.1	23.5

SOURCE OF DATA:

United States Department of Labor, Bureau of Labor Statistics, Retail Food Prices by Cities.

Minimum wholesale and minimum retail prices for fluid cream and fluid nonfat milk were established in the Los Angeles County,

Orange County and San Bernardino-Riverside marketing areas following the four public hearings held for that purpose. The 1957 Session of the Legislature amended the Agricultural Code, effective September 11, 1957, providing the Director of Agriculture with permissive authority to establish minimum prices for fluid nonfat milk. Permissive authority to establish minimum prices for fluid cream already existed in coincidence with the authority to establish minimum prices for fluid milk.

The Golden Chain Marketing Area, which consisted of parts of Amador, Calaveras, El Dorado, Nevada and Placer Counties, was modified to include all of Amador, El Dorado, and Nevada Counties and the eastern portion of Placer County.

The Modoc County and Lassen-Plumas-Sierra Marketing Areas were consolidated into one marketing area, and named the Northern Sierra Marketing Area. This consolidation reduced the number of marketing areas in the State to 33.

As a result of the hearings held in 1957, all marketing areas have been brought under the standards of Assembly Bill No. 2335, enacted by the 1955 Session of the Legislature.

The quantity discount programs operating in conjunction with minimum wholesale prices of fluid milk in the Alameda-Contra Costa, Fresno, Kern County, Los Angeles County, Orange County, Sacramento, San Bernardino-Riverside, San Diego County, San Francisco, San Joaquin County, and Santa Clara Marketing Areas have resulted in greater delivery efficiency by increasing the size of the average delivery.

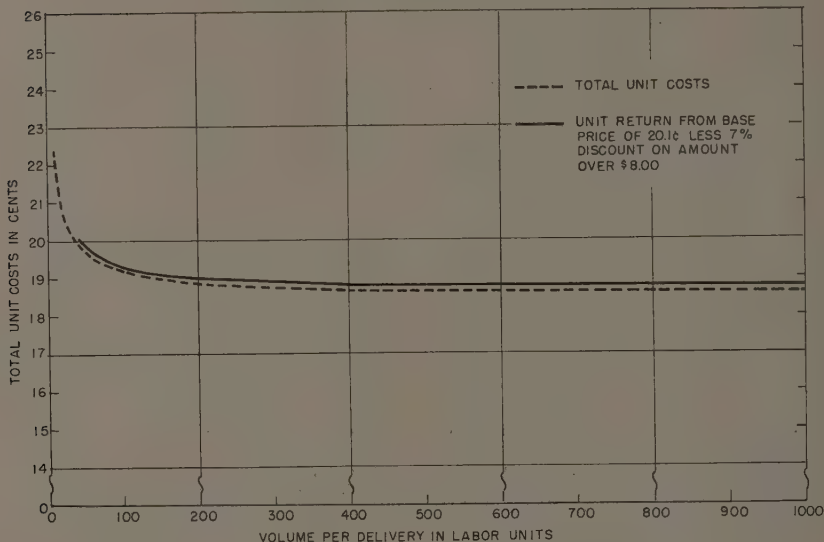
The quantity discount programs provide an incentive for the wholesale customer to increase the size of his purchase by reducing the number of distributors serving him, or by reducing the number of deliveries. Under these programs, the minimum wholesale prices decrease as the sizes of the deliveries increase.

Chart B, using the San Diego County Marketing Area as an example, shows a comparison of the minimum wholesale prices, labeled "Unit Return," and shown as a solid block line, with unit costs, labeled "Total Unit Costs," and shown as a broken line:

Seventy-seven cost of distribution studies were completed for fluid milk, three for fluid cream, three for fluid skim milk, and

EFFECT OF VOLUME PER DELIVERY ON UNIT COST AND UNIT RETURN

FLUID MILK—WHOLESALE—QUARTS
SAN DIEGO MARKETING AREA



11 studies were adjusted for labor increases occurring in the year 1957. The bureau made investment studies of seven processing and distribution plants, and published investment study results covering 18 plants. Special studies were made of the cost of handling bulk milk through country plants, the cost of handling dairy products through retail stores, and the cost of paraffin wax used in packaging in fibre containers. A study was made of the impact of quantity discount on wholesale prices in the Alameda-Contra Costa Marketing Area.

Two thousand, three hundred eighty-eight surveys were made of the cost of producing fluid milk by 462 fluid milk producers, and 395 surveys were made of the cost of producing manufacturing milk by 77 manufacturing milk producers. The purpose of these surveys was to determine the cost of producing and marketing fluid milk and manufacturing milk in various milk production areas throughout the State.

In general, costs of producing market milk showed little change from a year ago, reflecting only seasonal variations in production patterns and feed costs. Continued increases in milk production per cow, and

somewhat greater labor efficiency in the producer operations, tended to offset any material change in other cost increases during 1957. An abundance of feed and forage, with favorable weather conditions, helped to increase the milk production in California.

In September, 1957, a regional control board was formed, to be known as the Northern San Joaquin and Sacramento Valley Regional Producer Control Board. It is comprised of seven members representing the San Joaquin, Stanislaus, Sacramento, Sutter-Yuba, Butte-Glenn and Shasta-Tehama marketing areas. The former Sacramento Area Producer Control Board was discontinued in July, 1957, in favor of the regional board embracing the additional marketing areas.

In October, 1957, the bureau held nomination meetings throughout the State for the purpose of receiving nominations for appointment to the California Dairy Industry Advisory Board. After the nominations were received, 10 appointments were made to fill vacancies.

As of January 1, 1958, 1,540 fluid milk distributors were licensed to do business as

distributors in the State of California. Of these, 239 were bonded distributors purchasing fluid milk from producers, 68 were cash affidavit distributors purchasing fluid milk from producers and paying cash upon receipt of the milk, 182 were producer-distributors, and 955 were subdistributors purchasing their supplies from distributors. One hundred ninety-nine of the bonded distributors were bonded for the legal maximum of \$5,000, 24 for \$3,000, seven for \$2,000, and nine for \$1,000.

In 1957, the bureau conducted 688 audits of the payments to producers by distributors for fluid milk. The audits covered 35,246 producer months, and resulted in the recovery of \$202,815 for 1,518 fluid milk producers.

The bureau filed 22 court actions and two license actions during the year. No court actions were filed against the bureau. Collections in civil penalties amounted to \$11,450.

California Dairy Industry Advisory Board

The California Dairy Industry Advisory Board is now in its thirteenth year of service to California's dairy industry. The 1957 Session of the Legislature unanimously continued the board for another eight years.

The function of the board is to promote and increase the sale and use of milk and dairy products. During 1957, per capita sales of fluid milk in California reached an all-time high of 136.2 quarts.

During the year, several special projects were carried on in co-operation with other agencies. The board presented a new mobile dairy unit to the Los Angeles City Schools. This unit replaced one which had worn out. The old unit had been viewed by more than 1,500,000 school children, who witnessed a demonstration of a cow being milked, and who were shown a young calf. They were also taught how butter is made, and were told of the necessity of an ample supply of milk and dairy products in the diets of children. The Los Angeles Board of Education maintains this equipment, and supplies the teacher and driver. The dairy industry provides the animals.

The personnel of the board's staff have devoted a considerable portion of their time in working with the schools and the State Department of Education in promoting the school lunch program and the special milk program. Participation in the school lunch program has doubled since 1945. This program now uses 271,000,000 half-pints of milk



One of the special projects carried on by the Dairy Industry Advisory Board. This mobile dairy unit was presented to the Los Angeles City Schools. Advisory Board Photo.

having a resale value of approximately \$20,000,000.

Exhibits were presented at the State Fair and the Los Angeles County Fair. Several traveling displays were developed and used by a number of county and district fairs throughout the State.

A new 16 mm. color and sound movie, entitled "Youth in Dairying," was made. It graphically shows the various breeds of dairy cattle against a background of California scenery in widely scattered regions of the State, and depicts youth clubs and students caring for dairy animals. A new 35 mm. filmstrip, entitled "Our Trip to a Dairy Farm," was also produced. It portrays a visit to a dairy farm by a group of first grade children. They see the processes by which

milk is produced on the farm, and transported to a distribution plant.

Two new films are in production: one, in co-operation with the California Home Economics Association, is designed to recruit girl students into a career in home economics; the other, in co-operation with the State Department of Education, will show good management practices in a school food service program.

Several special promotional programs were carried on in co-operation with other California promotional groups, such as the California Beef Council, Bushberry Advisory Board, Turkey Promotion Board, Honey Advisory Board, and Cling Peach Advisory Board. These promotions helped to expand the opportunities for "selling dairy products."

Bureau of Shipping Point Inspection

W. F. ALLEWELT, *Chief*

H. W. PETERSON, *Assistant Chief*

P. V. STAY, *Assistant Chief*

The Bureau of Shipping Point Inspection conducts all of its work under an agreement between the Director of Agriculture of the State of California and the Director of the Fruit and Vegetable Division, Agricultural Marketing Service, U. S. Department of Agriculture. These two agencies jointly operate the California Federal-State Inspection Service, providing inspection and certification of fresh fruits, nuts and vegetables on an optional self-supporting basis.

The work of the bureau is authorized in Chapter I, Fruit and Vegetable Certification, Agricultural Code. Federal authority for conducting the work is provided under Title 7, Chapter 1, Agricultural Marketing Service, Department of Agriculture, Sections 51.1 through 51.67.

Certificates of inspection under the above authority are admissible as prima facie evidence in all state and federal courts.

The activities of this bureau during 1957 were similar to those of other recent years. Operations were conducted in 31 areas throughout the State. Permanent district of-

fices are maintained in 11 of these, where shipments of fruits and vegetables are made during the entire year. The remaining 20 districts are operated on a seasonal basis, with the service available as needed, and extending from a period of six to eight weeks in some of the fruit shipping areas to approximately eight months in the winter and spring vegetable producing districts.

United States Department of Agriculture co-operative agreements are in effect in 46 other states. A correlated inspection service also is conducted directly by the Agricultural Marketing Service in approximately 80 receiving markets throughout the United States.

Receiving market offices may make appeal inspections on products received from any area, whenever a financially interested person is dissatisfied with the results of the inspection made at the shipping point, as shown by the certificate issued there.

All inspections are made only upon the request of persons or agencies having a financial interest in the product offered for in-

spection. Such requests are principally from growers or shippers, but they may be from railroads, cold storages or other organizations that may desire to establish the quality, condition or grade of a product. The bureau has no regulatory functions or powers and is completely self-supporting from charges made for the services that are performed.

Regular inspection fees were on the basis of \$10.80 per carlot until September 1st, on which date they were raised to \$12 to meet increased expenses.

The general administration of the work is handled by the chief and two assistant chiefs of the Bureau of Shipping Point Inspection. These are employed on a co-operative basis as federal supervisor and assistant supervisors for this work in the State of California.

Field Inspection Force

In addition two area supervisors and 12 district supervisors are designated as agents or collaborators by the United States Department of Agriculture. All other inspectors are employed by the California Department

of Agriculture, and are licensed for this work by the United States Department of Agriculture.

During 1957 all inspections, converted to a carlot basis, totaled 175,246, as compared with 182,980 in 1956, and 191,988 in 1955. The lowest seasonal volume of work, as usual, occurred during March, when the minimum number of inspectors employed was 89. A rapid increase in the work occurred as always during the latter part of April and early May. The volume continued to increase, with some fluctuation, until the peak of the inspection work in August, when a total of 322 inspectors were employed in 1957. By September 15th the inspection force was reduced to 165 men, and by November 20th to a total of 96 inspectors employed.

Inspections generally are made as the products are being graded, packed and loaded for shipment. Products inspected usually are loaded into refrigerated railroad or express cars, but many shipments are forwarded by refrigerated trucks, some to distant markets.



Shipping point inspectors grading and sizing grapefruit at Indio. When inspection of samples is completed the tilted table rolls fruit into containers and scales show weight of defective and under-size fruit.

Most inspections are made in packing houses, particularly in the case of fruits or washed products, such as celery and potatoes. Lettuce is inspected either in the field at the time of packing, or at the vacuum coolers.

For the actual inspection or examination of the product, containers are selected after they are packed. A careful examination of the product is made, with respect to proper packing, uniformity of size and arrangement, quality, condition, size and presence of defects affecting the particular grade that is to be certified.

A detailed written record is kept, on an official notesheet, as each package is examined. From these facts the grade is determined, and the shipper is supplied with an official certificate after the inspection is completed. The packinghouse manager or foreman also is kept informed regarding the results of the inspection. This information is supplied to assist the packer to meet the desired grade.

Optional U. S. Standards

Optional U. S. Standards, which have been established by the U. S. Department of Agriculture, generally are used as the basis of the inspection work. Such standards now are in effect for 78 different fresh fruits, nuts and vegetables. During 1957 more than 50 different products were inspected in California on the basis of these optional standards.

During the year the Bureau of Shipping Point Inspection co-operated with the Standardization Section staff of the Agricultural Marketing Service in the completed revision of U. S. Standards for California Oranges, Celery, Fresh Tomatoes and Walnuts in the shell. Certain changes in commercial practices indicated the need for the revision.

Studies were made of the grading, sizing and packing operations which were bringing about changes in the commercial practices. The Washington, D. C., office sent representatives to the State who worked closely with the industry and the inspection service in California, with the result that mutual agreement was reached and the grades were revised.

The bureau also assisted in the investigations required by the proposed revisions of the U. S. Standards for Northern Grown Onions, Nectarines, Peaches, Lemons, Strawberries and Potatoes.

The United States Standards, as shown by the inspection certificates, are used to a large extent as the basis of sales of California fruits, nuts and vegetables in markets throughout the United States and in many foreign countries.

Most inspections are requested and made for this purpose. Many shippers who operate packinghouses place blanket orders with the inspection service for the inspection and certification of all of their shipments. Others place orders for the inspection of a certain number of cars each day, while still other shippers may request inspections of individual cars only as these may be required by their methods of sales and operation.

Certificates Used in Claim Adjustment

The inspection certificates are used as the basis of adjustment of claims between shippers and the railroads, and of disputes between buyer and seller. This includes the settlement of cases under the Federal Perishable Agricultural Commodities Act, and under California marketing legislation administered by the Bureau of Market Enforcement, of the California Department of Agriculture.

The Canadian Government, as a condition for import, requires that some 20 different fruits and vegetables meet certain U. S. Standards, as evidenced by inspection.

The U. S. Apple and Pear Export Act establishes certain U. S. Standards, and other requirements, for these products when exported from this Country, and requires special "export form certificates" as evidence of compliance.

The U. S. Standards, as used in connection with inspection, both in the producing districts and receiving markets, furnish a uniform basis for comparison of the prices quoted in market news reports.

In many instances the application of the U. S. Standards has resulted in improved practices in growing, harvesting, grading and packing.

A number of marketing orders, under authority of California and federal legislation, have been established at the instance of growers, to promote the orderly marketing of their products. These in general establish minimum legal standards of grade, and in some cases maturity, size, etc. Many of these are U. S. Standards, or are based on U. S. Standards with some modification. In other cases specific standards have been developed by the industry organizations.

These minimum grades for the various products were recommended by industry committees, and were approved either by the Director of Agriculture of the State of California or the Secretary of Agriculture of the United States, depending upon which marketing order was applicable.

The shippers or handlers were required to furnish federal-state inspection certificates to the various administrative organizations to show compliance with the standards required by the marketing orders.

The various marketing orders follow:

California State Marketing Orders

Fresh Bartlett Pears, Fresh Fall and Winter Pears, Bartlett Pears for Canning, Fall and Winter Pears for Canning, Desert Grapefruit, Delta White Potatoes, Long White Potatoes.

Federal Marketing Orders

Desert Grapefruit, Bartlett Pears, Interstate Winter Pears, Elberta Peaches, Plums, Almonds.

For the 1957 season from August 14th until December 31st a total of 6,904,746 pounds were inspected.

As previously stated the inspection work is completely self-supporting, and charges must be made to pay for the work performed. During 1957 it became apparent that the rate of \$10.80 for inspection of a carlot no longer was adequate, and effective September 1st this rate was changed to \$12.

In some cases where the carlot rate is inadequate, or cannot properly be applied, different charges then are made, usually at an hourly rate, with additional charges for mileage and other expenses. In some cases expense guarantees are required, covering the period during which inspection is to be furnished.

Under the marketing orders covering desert grapefruit, pears for canning, and long white potatoes, contracts are made between the Bureau of Shipping Point Inspection and the boards which administer these orders. These provide for payment for inspection by the boards based on the cost of handling their inspection work.

Bureau of Weights and Measures

JAMES E. BRENTON, *Chief*

BURRIS G. WOOD, *Assistant Chief*

Provisions concerning tolerances and specifications for commercial weighing and measuring devices, standards of weights and measures, tare weight of containers used in making delivery of edible agricultural commodities to processors, are contained in Chapter 8, Title 4 of the California Administrative Code.

The laws relevant to weights and measures, specifically, gasoline, motor oil, anti-freeze, brake fluid, weight of bread loaves, and baled hay, are contained in Division 5 and Division 8, Business and Professions Code of California.

It is the duty of the state and county weights and measures officials to enforce these laws, rules, regulations, and tolerances and specifications. In the counties, weights and measures enforcement is the responsibility of the sealers of weights and measures.

Routine enforcement work includes the annual inspection as to the accuracy of all commercial weighing and measuring devices. It is also the duty of the weights and measures officials to enforce those provisions of the law concerning public weighmaster, inspection of petroleum products (specifically gasoline and motor oil), inspection of anti-freeze and brake fluid, and inspection of the labels identifying the brand name of these automotive products. Gasoline and motor oil "price signs," and other advertising media are scrutinized by county and state enforcement officials.

Millions of field lug boxes are used in transportation from producer to processor of numerous agricultural products. The tare weight of these containers is determined carefully and established in order that neither producer nor processor will suffer financial loss.

In addition to the enforcement of the laws specifically applicable to the subjects mentioned, the state and county officials also enforce those standards of weight and measure as they concern butter, mill products, coal, charcoal, codfish, onions, peas, potatoes, and berries in baskets.

Part of the inspection work of weighing and measuring devices is performed by employees of the bureau. During 1957, these state employees inspected 2,223 vehicle scales; 1,511 dispensing devices used in connection with the sale and measurement of liquefied petroleum gas in liquid form; 1,026 liquefied petroleum gas vapor meters; trained and assisted county employees in the inspection of farm holding tanks and farm holding tank provers.

It is also the duty of the bureau to inspect and certify as to the accuracy of the standards of weights and measures used by the 275 county weights and measures officials.

During 1957, employees of this office inspected and sealed 3,564 weights, 195 liquid measures, 32 linear measures, 149 pumps, 13 meters, 3 fabric measuring devices, 4 glass graduates, 19 vehicle tanks, 44 meter provers, 1 water meter, 2 calibrating tanks, 402 scales, and 7 farm holding tanks.

Approvals permitting the sale and use in this State of 37 new model weighing and measuring instruments were issued.

During the 1956-57 Fiscal Year, the bureau issued 2,502 principal public weighmaster licenses, 1,448 branch location public weighmaster licenses, and 14,971 deputy public weighmaster licenses; a total of 18,921 licenses issued under the provisions of Chapter 7, Public Weighmasters, Division 5, Business and Professions Code of the State of California.

As part of the bureau's work and in accordance with the provisions of Article 3A, Chapter 7, Petroleum, Division 8, of the



Mr. Frank Geris, Weighing Equipment Technician, State Bureau of Weights and Measures, operating the Russell Balance for 1,000-pound test weights, built by Brown Industrial Scale Company, San Francisco, to specifications and design of Mr. H. H. Russell, Chief Scale Unit, Mass and Scale Section, National Bureau of Standards, Washington, D. C.

This balance, sensitive to 5 grains under full load, is a recent acquisition of the State Bureau and will be used in certifying the accuracy of 1,000-pound weights used by county weights and measures officials.

Business and Professions Code, the Bureau issued 90,580 motor fuel pump license tags to be affixed to the retail motor fuel dispensing devices located in 23,303 retail outlets. Antifreeze permits totaled 55, and the brake fluid permits issued were 73.

State and county weights and measures employees were also engaged in making

56,504 inspections of service stations and garages; issuing 1,291 citations requesting law compliance; testing 5,286 samples in laboratories; ordering corrections on 4,406 signs; holding 79 office hearings, and prosecuting 78 weights and measures law violators, all of them being convicted.

TABLE 1

1957 Annual Statistical Report—County Sealers of Weights and Measures

Establishments visited during 1957.....					210,845
Packages or containers inspected.....					
Light				214,227	
Correct				4,154,518	
Heavy				1,056,351	
Total					5,425,096
Lubricating oil bottles tested for capacity.....					
Inspected					83,491
Passed					75,016
Condemned and confiscated					950
	Sealed without correction	Sealed after correction	Out of order	Condemned and confiscated	
Scales					
Counter—other than computing	27,061	8,385	2,379	82	
Spring	35,521	10,468	1,929	412	
Computing	54,475	28,522	7,264	305	
Platform and dormant	26,491	15,783	5,185	137	
Tank	178	131	34	1	
Hopper	1,460	875	337	9	
Livestock	1,596	857	348	16	
Vehicle	3,048	2,277	1,036	35	
Person weighers	9,208	2,380	1,413	150	
Meat beams and steelyards	2,660	1,115	350	32	
Abattoir (monorail)	1,734	884	428	5	
Prescription	2,464	1,757	135	9	
Railroad track	69	88	29	0	
Weights	244,896	4,699	853	1,623	
Vehicle tank compartments gauged	1,908	1,667	375	0	
Vehicle tank meters	2,724	2,708	522	22	
Bulk plant meters	774	592	144	0	
Retail pumps and meters	99,372	17,468	10,611	92	
Lubricating oil meters (retail)	2,209	58	79	3	
Grease meters	23,080	887	1,243	32	
Linear measures	13,198	120	382	97	
Liquid capacity measures	65,806	365	86	42	
Farm holding tanks	1,278	314	166	0	
Totals	621,210	102,400	35,328	3,104	
Prosecutions					381
Convictions					373
Acquittals					6
Citations					898
Cases pending					126
Otherwise disposed of					58
Total fines paid					\$17,650

Division of Plant Industry

ALLEN B. LEMMON, *Chief*

The Division of Plant Industry consists of six bureaus: Chemistry, Entomology, Field Crops, Plant Pathology, Plant Quarantine, and Rodent and Weed Control and Seed Inspection. These bureaus co-operate very closely, and with many other official agencies, in handling the many related functions of this division. The details of the work are presented in the reports of each of the bureaus.

The primary responsibilities of this division are:

1. Prevention of the introduction and spread of insects, plant diseases, nematodes, noxious weeds, and other crop pests. Quarantine action, pest detection surveys, and pest suppressive action are involved in this work. Most of this work is done in co-operation with county agricultural commissioners.

2. Control of predatory animals to protect livestock, poultry, certain crops, such as melons and grapes, and as an aid in the suppression of rabies. This is a joint program carried on with the U. S. Fish and Wildlife Service.

3. Prevention of fraud and deception in the marketing of nursery stock, seeds, fertilizing materials, pesticides, and livestock

feeding stuffs. This involves examination of labeling and laboratory analysis of official samples of the various commodities to determine compliance with law.

4. Regulation of the use of pesticides, including injurious herbicides and other injurious materials to permit satisfactory pest control without injury to persons, animals, and property. This includes not only the application of pesticides by commercial pest control operators, but also guidance to farmer users, and inspection of produce for spray residue at time of marketing.

5. Grading of field crops under United States grades.

6. Regulation of agricultural warehouses.

Increased attention was given to plans for an improved pest detection program, particularly with regard to fruit flies. Intensive trapping did not reveal any melon flies in addition to the one reported in Los Angeles in July, 1956, and by the middle of the year this program was integrated into a statewide fruit fly trapping program.

With the reduction in the number of properties infested with Khapra beetle, major emphasis was shifted to a comprehensive program of inspection to find all infestations so that they might be eradicated.

DIVISION OF PLANT INDUSTRY

ALLEN B. LEMMON, *Chief*



Chemistry
Entomology
Field Crops
Plant Pathology
Plant Quarantine
Rodent and Weed Control
and Seed Inspection



Bureau of Chemistry

ROBERT Z. ROLLINS, *Chief*

DEWITT BISHOP, *Assistant Chief*

The Bureau of Chemistry administers five parts of the Agricultural Code pertaining to agricultural chemicals. Chapter 1a of Division 2 regulates the agricultural pest control business. The four articles of Chapter 7, Division 5, pertain to pesticide residues on produce, the labeling and sale of fertilizing materials, the labeling and sale of pesticides (economic poisons), and the use and application of injurious materials.

Administration of these five related laws is the responsibility of one staff consisting of inspectors, chemists, pest control supervisors, entomologists, and auditors.

Throughout the State, 14 inspectors examined agricultural chemicals and drew samples from materials observed in the channels of trade. Most of the samples were sent to the main laboratory in Sacramento for examination and analysis.

Agricultural gypsum samples were analyzed for prompt results in a branch field laboratory in Bakersfield, close to the source of extensive gypsum mining on the west side of the San Joaquin Valley.

Pesticide residue examinations of produce are a daily workday procedure in the large wholesale produce markets in Los Angeles and San Francisco. The branch laboratory at each market speeds reporting of chemical work and reduces delay in market sales.

A part-time laboratory is maintained in San Diego for prompt determination of residues on locally grown crops in season.

Legislation During 1957

Each of the five parts of the Agricultural Code administered by this bureau were amended by the 1957 Legislature.

The law relating to agricultural pest control business was amended to increase the fee for an agricultural pest control operator's annual license from \$15 to \$20. The revenue from the \$15 fee did not provide enough funds to support the administration of the laws and regulations. Section 160.5

was amended with regard to publishing an agricultural commissioner's intentions to adopt regulations.

Three amendments were made to the fertilizing materials laws. The definition of auxiliary plant chemicals was changed to include, in addition to the other materials listed, enzymes, synthetic polyelectrolytes, biocatalytic soil conditioners, lignin or humus preparations, and wetting agents sold to promote penetration of irrigation water. This requires registration as auxiliary plant chemicals and informative labeling of a number of products which were formerly regarded as soil amendments. The most important change will be the requirement of a proper statement of composition on the label of such products. Section 1038 has been changed to extend the tonnage license tax on agricultural minerals at 3 cents per ton to September 20, 1959, during which time a study will be made to provide a basis for setting the tax rates on commercial fertilizers and agricultural minerals. Section 1044 has a minor change with regard to rules and regulations.

Only minor change was made in the spray residue laws with regard to making rules and regulations.

Section 1080 concerning use and application of injurious materials now omits a paragraph which stated that the section was in force until 91 days after the termination of the 1957 Session of the Legislature. The section is now permanent.

The economic poisons article was amended to exempt pesticides which are also commercial feeding stuffs as defined in Section 1081.

Heretofore, a chickenfeed containing nicotine or livestock feed containing phenothiazine for control of intestinal parasites was subject to both the economic poisons article and the feeding stuffs chapter of the Agricultural Code. The law as now amended places such mixtures exclusively under the jurisdiction of the feeding stuffs

chapter administered by the Bureau of Field Crops. In addition Section 1068, pertaining to the mailing of copies of rules and regulations, was amended to conform to uniform wordings of similar sections elsewhere in the Agricultural Code. All these amendments became effective September 11, 1957.

In addition to these amendments of the laws administered by the Bureau of Chemistry, the 1957 Legislature added Chapter 7b to the Agricultural Code on livestock remedies, effective January 1, 1958, and administered by the Bureau of Field Crops. When the new law became effective, some products, such as those for control of roundworms or tapeworms in livestock, became subject to the provisions of the new law and henceforth exempt from those of the economic poisons article. In general, products intended for internal administration, orally, or hypodermically, are livestock remedies. Products intended for use as sprays, dusts,

or dips for control of flies, fleas, lice, ticks, mange mites, and other insects or mites remain economic poisons.

Highlights of the Year

The tonnage of commercial fertilizers in California during 1957 exceeded the tonnage in 1956 by 5 percent, and was above 1,000,000 tons for the second successive year.

Commercial fertilizers are fertilizing materials containing 5 percent or more of nitrogen, available phosphoric acid, and soluble potash, alone or together, except manures, hays, straws, peat, and leaf mold.

Use of liquid materials continued to increase and made up 38 percent of the entire tonnage.

Another class of fertilizing materials is agricultural minerals. There are minerals or mixtures of minerals and organic substances with less than 5 percent of the three major plant foods mentioned, except sand and soil.



Official samples are legal evidence for appraising the standard and quality of agricultural chemicals. After analysis, the remaining materials are preserved for several months for possible future need. Shirley J. Persinger, laboratory assistant, checks some of the samples.

The tonnage of agricultural minerals decreased 3 percent below the previous year.

The tonnage of commercial fertilizers sold in California during the calendar year 1957 reached a record high of 1,105,453 tons. The tonnage of agricultural minerals dropped slightly to 787,589 tons. The number of registrants for the Fiscal Year 1956-57 increased to all-time highs of 403 for commercial fertilizers and 1,013 for pesticides. The number of firms registering agricultural minerals increased slightly to 175. A record high of 12,441 pesticide products were registered. The acreage treated with pesticides by aircraft dropped slightly from the previous year's record to 5,320,617 acres.

Ammonia solution 20-0-0 made up one-fifth of the entire tonnage of commercial fertilizers, and totaled 59,000,000 gallons. Inspectors continued to carry the field kits adopted in 1956 with which they made 151 tests of the solutions in the field. If the field test indicates the material is low in nitrogen and might not meet the guarantee made for it, the inspector draws a sealed sample for official laboratory analysis. Many more lots of the solutions can be examined promptly with the rapid field test than can be handled by shipment of samples to the bureau laboratory in Sacramento. The occasional low analysis lots found are often relabeled or brought up to strength soon after field testing. Many aqua ammonia dealers have been encouraged to obtain test equipment for their own use. The bureau's special publication issued annually to show the results of analyses of samples will report the number of field samples found acceptable in 1957 by hydrometer test, as well as those found deficient.

Prosecutions and Similar Actions

The law governing agricultural pest control operators requires them not only to secure a license from the department, but also to register with the county agricultural commissioner of each county where they do work. Persons buying injurious materials must first secure a permit from the agricultural commissioner, and dealers selling such injurious materials must obtain a signed statement from the purchaser that he holds a valid permit for the quantity and kind of material purchased.

A vegetable farmer who applied parathion without a permit and the dealer who sold the material to him pleaded guilty to violating the law. The farmer was fined \$100 and

the dealer \$50. In addition, a jail sentence was suspended pending future compliance. The violations were discovered through pesticide residue inspection and the finding of excessive parathion residue on the grower's cabbage.

An insecticide salesman was sentenced to pay a fine of \$100 or serve 50 days in jail when he sold and delivered a parathion pesticide compound to a farmer who had not secured a permit to use the injurious material.

A firm continued to sell deficient gypsum after it was warned repeatedly to make certain that the material it sold conformed to the percentage guaranteed on the label. Complaint was filed against the firm and it pleaded guilty to the charge. It was sentenced to pay a fine of \$500 plus 30 days in jail, with \$250 of the fine and the jail sentence suspended while the firm was put on probation for two years.

Three young men began to do agricultural pest control work for hire in violation of law. Several days were required to locate them because they were using fictitious names and addresses, but they were traced by their car. All were convicted of operating without a license and without county registration. Each man served 12½ days in jail in lieu of each paying \$50 fine.

Another operator who committed similar violations, operating without a license or registration, was arrested, fined \$50 and placed on probation for one year.

An agricultural commissioner revoked the county registration of one operator who applied injurious materials without a permit, applied another material contrary to the conditions of a permit, permitted excessive drift onto neighboring hay and pasture, and failed to submit required monthly reports of work done. Another commissioner suspended an operator's registration when the operator failed to submit monthly reports to the commissioner as required by the commissioner's regulations.

Investigative Hearings

Several investigative hearings were held on suspected violation of laws and regulations governing agricultural chemicals. Two cases involved drift of pesticides onto public roads during application by aircraft. Two cases involved use of injurious materials without a permit from the county agricultural commissioner, and one case involved a dealer who sold an injurious material with-

out securing a signed statement from the purchaser that he had a valid permit to use the material. In another case, an aircraft operator allowed parathion spray to drift onto a public utility crew working along the side of a field.

Injurious Herbicides Regulations

Two public hearings were held to amend the regulations governing the use of 2,4-D and similar injurious herbicides. The regulations were amended to permit use of highly volatile forms of 2,4-D for control of weeds in the Montpelier area of Stanislaus County.

County Agricultural Commissioners of Merced and Stanislaus Counties testified that

use of the material between December 1st and March 1st would not present a hazard to grapes or other susceptible crops growing in that vicinity. Use of highly volatile 2,4-D is banned in all other parts of the State, except on isolated grainfields in the Carriso Plains in San Luis Obispo County, because vapors from fields treated with such herbicides can drift for long distances on the wind and injure susceptible crops on other properties.

A hearing was held in Lodi at the request of vineyardists to consider expanding the western boundary of the "hazardous area" to include several islands in the Sacramento-San Joaquin Delta, because grape growers



Anhydrous ammonia is delivered to rail sidings in farm areas and pumped through portable pumps into steel cylinders which can be carried on tractor-drawn injector equipment (lower right) or tubed into irrigation water (lower left)

suspected that the use of 2,4-D on grain on those islands drifted on prevailing winds and affected the growth and production in their vineyards. A change in the boundary would have curtailed 2,4-D application for weed control in grain. Testimony and information taken at the hearing did not substantiate the need for expansion of the hazardous area, and no change was made in the boundary.

When the main growing season was over, it became evident that drift of 2,4-D caused less trouble throughout the State in 1957 than it had in previous years.

Inspection and Sampling

Federal statistics indicate that 250,000 tons of dried manure are sold annually in California. This is approximately 85 percent of the total national usage and represents sales of more than \$5,000,000. Most of the bagged material is labeled "Weed seed free." In addition to the customary chemical analysis of official samples of manure to determine plant food content, a few samples were examined for weed seeds to check on this claim. Looking for weed seeds in manure is somewhat like looking for the proverbial needle in a haystack, but the examinations indicated that the dry, ground, bagged manure marketed by large firms in the State is not an important factor in the dissemination of weeds. Most of the seeds found in the material by microscopic examination did not germinate. Apparently they were killed by the way the manure is stored for many months in large piles, and turned several times before being ground and bagged.

Successful fertilizer trials, the advice of experts who recommend increased use of fertilizer, and the intensive farming in some areas have increased the number of distributors of anhydrous ammonia. This, in some measure, accounts for the increased tonnage mentioned earlier. The gas is compressed and handled in steel cylinders similar to butane fuel. The bureau's supervising chemist, using special equipment, field-tested 39 different lots of compressed anhydrous ammonia to determine quality. All lots met their guarantee of nitrogen 82 percent.

Sodium hypochlorite solutions are sold in two strengths. The disinfectant bleach, commonly sold for household use, is guaranteed to contain sodium hypochlorite 5.25 percent and official samples show that these materials usually meet their printed statement of active ingredient. The stronger solutions used for commercial disinfection, and for

control of algae in swimming pools, are guaranteed to contain 16 percent. This stronger solution is chemically unstable, and decomposes rapidly.

The analysis of samples shows that solutions seldom meet their guaranteed composition unless sampled the day of manufacture, and commonly they contain only 12 percent instead of 16 percent one month after manufacture. A number of shipments of deficient materials were quarantined in the southern part of the State.

A meeting of all interested manufacturers was held in Los Angeles to discuss various methods of correcting labeling so that the material would be correctly labeled at the time of sale. Subsequently there was some improvement as manufacturers limited dealers' purchases to two-week intervals. It is possible that label guarantees may be reduced, industrywise, in the future to 12 percent, or to some other appropriate figure.

During the year, chemical analysis was made of 8,096 samples, including 2,659 commercial fertilizers, 419 agricultural minerals, 11 manures, 13 auxiliary plant chemicals, 17 soil amendments, 2,127 economic poisons, 2,077 samples of produce for residue, and 773 miscellaneous samples. In addition 151 lots of aqua ammonia were checked by field test and 1,218 avocados were submitted by county agricultural commissioners and the Bureau of Fruit and Vegetable Standardization, and analyzed in co-operation with them to determine the percent of oil as a measure of maturity.

Approximately 420 samples analyzed for other state agencies required 158 man-days by the most experienced chemists. In addition to chemical laboratory analyses, bioassay tests help distinguish between insecticides and breakdown products, determine potency of insecticides, rodenticides, weed killers, and explore samples for presence of unknown toxicants. Houseflies, clothesmoths, other test insects, guppies, daphnia and white rats are reared for the bioassay laboratory. Plants and sprouting seed are used for hormone tests.

Results were reported by these methods on 113 information samples. The nature of the tests require replication of procedure, lengthy preparation of chromatographic methods, germination of seed, and growth observation over extended periods. Miscellaneous samples were analyzed for co-operating officials to assist them in their official work.



Eva M. Humphries, Bureau of Chemistry Laboratory Assistant, operates a fast speed mill used to grind official fertilizer samples. Standard procedure rules used by all chemists require the grinding of samples to assure accuracy. The unit is housed in a ventilated hood to remove airborne dust.

According to the tolerances established in law, commercial fertilizers meet their guarantee for plant food when the percentage of nitrogen does not fall more than 0.25 percent, available phosphoric acid 1 percent, or soluble potash 0.5 percent below guarantee. Seventeen percent of the commercial fertilizers sampled were below guarantee in one or the other of the major plant foods. This figure compares with 15 percent in 1956 and 16 percent in 1955. Agricultural minerals are mineral substances which contain less than 5 percent of the three major plant foods.

Though some 20 different common minerals sold come under the class of agricultural minerals, about 85 percent of the tonnage sold to farmers is gypsum. There is considerable variability in the open pit gypsum and unless repeated analyses are made of representative samples, the producer's deliveries to farmers may differ from the guarantee. Of the 419 samples of agricultural minerals, 219 were gypsum, of which 28 percent were deficient. Whenever a deficiency occurs, the registrant-producer is expected to make suitable adjustment with the purchaser and explain his efforts for improvement of future shipments.

Accidents, Damages, Injuries

Every year pesticides are responsible for injuries and some deaths, especially to children through accidental exposure, or careless storage. Investigation was made of all cases in California that came to our attention in which injury from pesticides was suspected,

to determine if the labeling or packaging by the manufacturer was in any way responsible for the casualty, and to determine what steps might be taken to minimize recurrence of such accidents.

Because of the special attention given pesticides causing deaths, and publicity in trade journals by the pesticide industry in a commendable effort to promote safe handling of these materials, pesticides might be erroneously regarded as a major cause of accidental poisoning. Actually they are involved in about only one-tenth of the deaths caused by solids and liquids of all kinds.

Pesticides caused 11 deaths investigated by this bureau during the year.

A transient farm laborer broke into a grain storage tank during the night while it was under fumigation with methyl bromide and was found dead the next morning.

A man used an aluminum measuring cup in mixing some sodium arsenite solution to kill weeds in his garden. He left the emptied cup on top of a washing machine in his garage where his three-year-old daughter found it and drank enough of the adhering drops of poison to cause her death.

A three-year-old boy, playing in his grandfather's construction yard, found a pop bottle containing sodium arsenite solution which had been used to pour the weed-killer into cracks in pavement. The boy drank the solution and died.

A woman asked spraymen on a mosquito abatement crew for some of the insecticide they were applying so she could use it for controlling flies. The men gave her some of the emulsifiable mixture of toxaphene and DDT in a mayonnaise jar. Ten days later a neighbor's 17-month-old girl found the jar on the front porch of her house, drank the material and died.

A spray operator brought home a paper bag containing a remnant of parathion and placed it on a bracing in his garage about seven feet above the floor. About a year later his three-year-old son and 18-month-old daughter, with the aid of a bench and washing machine, got the bag and were found playing with it. The mother, aware of the danger, immediately bathed them but the girl became unconscious and died.

A contractor's foreman offered the men around him a drink from a whiskey bottle at the end of a day's work. The men refused, whereupon the foreman drank from the bottle, promptly became ill and died two

days later in a hospital from arsenic poisoning. The contractor had purchased sodium arsenite solution in five-gallon cans to control weeds. The solution had been transferred to some unlabeled cans to aid in carrying it, but how it got into the whiskey bottle was not determined.

A man purchased a can of sodium arsenite solution and a plastic sprayer attachment to screw on the can. The next day his wife found him holding the can with the sprayer attachment and crying that he had swallowed some of the poison. He died 45 minutes later in a hospital and no one could determine how the accident had occurred.

A man, spraying weeds around his house with sodium arsenite solution, set the measuring cup on the floor of a milk house. His three-year-old son drank from it and died.

The day after moving into a house, a two-year-old boy found a can of sodium arsenite weedkiller solution in a trash barrel where it had been discarded by the previous tenant. He drank from the can and died.

A swamper working for an agricultural pest control operator became ill while cleaning an airplane. He was given some atropine tablets and continued working for about 15 minutes when he collapsed in convulsions and died a few hours later. Apparently he was poisoned by residues of organic phosphates in the airplane equipment.

While unloading a truckload of supplies at his house, a gardener broke a package of small capsules containing ethylene dibromide. The next day his three-year-old daughter brought some of the capsules to him and asked if they were candy, and a few hours after that his two-year-old son became sick and died.

Of these 11 people killed by pesticides in California during 1957, seven were children less than four years old. Six deaths were caused by sodium arsenite solution and one each by methyl bromide, ethylene dibromide, parathion, and a DDT-toxaphene solution. The death of the swamper may have been caused by residues of demeton.

In several other cases, death was attributed to a pesticide in the first news reports. Later investigation showed the death was caused by something else.

There were several suicides and several attempted suicides in which the person deliberately swallowed a pesticide. There were a number of cases in which children acci-

dentally swallowed a pesticide, such as a rat bait, ant poison, nicotine sulfate solution, or lindane tablets, but recovered upon prompt medical treatment.

There were some cases in which a person was affected by a pesticide during its application. The most spectacular involved was phosdrin, an organic phosphorus compound somewhat similar to parathion and TEPP. It is classed as an injurious material usable only under permit from a county agricultural commissioner. Large amounts were used last year by agricultural pest control operators without known incident. Over the Labor Day weekend, shortly after it was registered for use on strawberries, approximately 16 farmers and farm laborers were ill after applying the chemical. Through radio and newspaper announcements, the agricultural commissioners of the counties concerned rescinded all permits, and warned against future use until the cause of the trouble could be determined.

A study of the individual cases determined that all the affected men applied the dust by hand without customary precautions. Some did not wear respirators, and others wore the wrong type of respirator. Most of the men wore loose clothing that permitted the dust to cover their legs and arms, and they did not wash it off when finished. Commissioners throughout the State were promptly notified of the accidents and they now do not issue permits for application of phosdrin dust by hand unless the user agrees to wear adequate respirator equipment and proper protective clothing.

Pesticide Residues

State and federal law put limits on pesticide residues on produce at harvest. All pesticide chemicals usable on food or feed crops now fall into one of four classes; (1) chemicals classified as not poisonous and usable without tolerance or exemption, such as sulfur and lime, (2) chemicals exempted from the requirements of a tolerance, such as bordeaux mixture, petroleum oils, and pyrethrum, (3) chemicals with zero tolerance, such as dinitro-o-cresol, TEPP, calcium cyanide, and (4) chemicals with specified tolerances higher than zero.

Most pesticides are already classified, but manufacturers of newer chemicals, and those with new uses for current chemicals, continue to collect field data to establish crop need and suitable tolerances.

The bureau analyzed 2,077 samples of produce, mainly fresh fruits and vegetables and hay, to determine compliance with legal tolerances. These included 1,795 official samples representing as many lots inspected on the wholesale and retail markets and 282 confirmatory or investigative samples drawn to secure information on residues.

A number of these information samples were drawn in field surveys of representative crops shortly before harvest for the area began. The official samples were not drawn completely at random but in many cases represented the lots and the kind of produce judged by trained inspectors most apt to carry over-tolerance residues.

Out of these selected samples, 8.7 percent were found to contain residues in excess of tolerances. In such cases, the over-tolerance lot was quarantined until it was reconditioned or dumped. The grower was warned about the violation and in many cases an investigation was made to determine the cause of the violation.

The usual cause of excessive residue was the application of the more persistent chlorinated hydrocarbons too close to harvest time. In these cases the grower was requested to schedule his pest control program to avoid excessive residues, and to consult his agricultural commissioner for guidance in his pest control problems. When the records showed that the shipment was a grower's second offense, he was cited into the county agricultural commissioner's office for an investigative interview to determine the cause of the violation, and 14 such interviews were held during the year.

Bartlett pears in the Sacramento Valley were examined at harvest time by inspectors for spray residue. One inspector was assigned exclusively to this work to make rounds of the packing houses. Fruit-cleaning methods were observed to determine whether they were appropriate. In an occasional packing house, fruit was packed directly without any type of residue removal process. Samples were drawn from any fruit in question and brought to the laboratory for residue analysis. No fruit was found with excessive residue. It appears that proper application and timing of spray materials provided pest control without residue problems.

Inspections in the northern county apple-growing areas showed that the crops did not carry excessive pesticide residues. Most farmers reported using DDT at some time during the growing season, but the highest

DDT residue found at harvest time in the Sierra Nevada foothills was one part per million, well below the legal tolerance of seven parts per million. Apples sampled at the Los Angeles and San Francisco wholesale markets were well within tolerance.

A stack of 602 bales of alfalfa hay was quarantined because it contained excessive DDT residue. At the end of the year the hay was still under quarantine awaiting suitable disposition. There is no way to recondition hay by washing or by other means to remove excessive DDT residue. The only non-feed use for it seems to be as a mulching material.

DDT continued to be the most common pesticide residue found on produce ready for market. The state and federal tolerance for DDT on produce is 7 parts per million (ppm). A total of 1,589 samples of fruits, vegetables, and fodder were analyzed for DDT in branch laboratories. In Southern California, out of 1,015 samples, none was found on 232 samples; trace to 1 ppm. was found on 183; 1 to 4 ppm. was found on 284; 4 to 7 ppm. on 184. Of the samples over tolerance and representing produce that had to be reconditioned, 7-14 ppm. were found on 81 and over 14 ppm. on 51 samples.

Parathion residue was more in evidence than in the previous year. The residue on fresh market produce must not exceed one part per million. A total of 812 analyses were made for this chemical. Approximately one-half showed no parathion, and 34 were over tolerance. Parathion was found on as many types of vegetables as was DDT. It was found in excessive amounts on 239 containers of strawberries. These were quarantined off sale and as there was no suitable way to remove the residue they were sent to the disposal dump.

Arsenical residues, once the major concern in residue enforcement work, are now seldom encountered. None was found on 37 samples analyzed for arsenic.

Pest Control by Aircraft

Many California farmers rely on trained operators to apply pesticides for them. This employment trend has increased as modern agriculture has found need for expensive application equipment, such as aircraft, to provide effective and economical pest control. Furthermore, many of the modern pesticides are dangerous to handle and farmers

prefer to hire trained and properly equipped operators to apply the chemicals for them.

A certificate of qualification or an apprentice certificate must be obtained through this Bureau for a person desiring to operate any aircraft in the business of agricultural pest control. The initial fee is \$25, and the renewal fee is \$5 for a calendar year.

An applicant for a certificate of qualification must have a valid apprentice certificate, and must submit documentary proof that he has operated aircraft for 150 hours in agricultural activities. He must pass a written examination covering the types of work for which he desires to qualify, to demonstrate his ability to conduct pest control operations and his knowledge of the nature and effect of the materials he uses for pest control.

Certificates of qualification were issued to 461 agricultural aircraft pilots during 1957, approximately the same number issued during each of the previous five years.

More than five million acres are treated with pesticides by these pilots and airplanes. The nature of the applications at low altitude and the heavy loads carried increase the hazards so that pilots must maintain constant attention toward careful operation.

During the year, 40 accidents occurred with pest control aircraft. In three-fourths of the accidents the airplanes were severely damaged, only one was reported moderately damaged, and seven were demolished. The causes were mostly divided equally between: (1) stalls on turns or loss of control, (2) engines quitting; and (3) hitting poles, wires, trees, high furrow ridges, and other objects. Fortunately, 28 of the pilots involved escaped injury, largely due to use of seat belts, shoulder harness, and hard hats. Five were killed, five had minor injuries, and three were severely injured.

Apprentice Pilots

An apprentice certificate permits operation of aircraft in the business of pest control under the direct and personal supervision of a person holding a certificate of qualifica-

tion. The fees are the same as those for the regular pilot, and a written examination covers the specific types of work for which the apprentice desires to qualify. A total of 177 apprentice pilots were certificated during the year, compared with 153 during 1956.

New Chemicals

New agricultural chemicals continue to be developed at a rapid rate and a number of new pesticide chemicals were registered for sale in California.

These included N-phenyl mercuri ethylene diamine for apple scab, trinitrobenzene-aniline complex as a rabbit repellent, N,N-diethyl toluamide and 2,3,4,5-bis butylene-tetrahydrofurfural, as insect repellents, 2-chlorallyl diethyldithiocarbamate, hexachloroacetone, 3(p-chlorophenyl)-1,1-dimethyl urea trichloroacetate, and 2-chloro-4,6-bis(ethylamine)-s-triazine for control of weeds, 3,5-dimethyl tetrahydro-1,3,5,2H-thiadiazine-2-thione as a soil fumigant, zinc benzothiazyl mercaptide for shot hole fungus, bis(S-(diethoxyphosphinothioyl)mercapto) methane for control of aphids and mites, O,O-dimethyl S-(4-oxo-1,2,3-benzotriazinyl-3-methyl) phosphorodithioate for control of insects and mites, O,O-diethyl-S-beta diethyl amino ethyl phosphorothiolate hydrogen oxalate, bis (dialkoxyphosphinothioyl) disulfides, and 2,3-p-dioxanedithiol-bis (O,O-diethylphosphoro dithioate) for control of mites, di-n-butyl succinate and di-n-propyl isochincomeronate as fly repellents for livestock, abiethylamine acetate for control of algae, and tributyl phosphorotrithiotite and S,S,S-tributyl phosphorotrithioate as cotton defoliant.

Much interest was shown during the year in gibberellic acid. Solutions of 10 to 100 parts per million show striking responses, such as stem elongation, increased size of dwarf plants, breaking of dormancy, and induction of some plants to flower ahead of schedule.

The chemical and its preparations fall within the class of fertilizing materials defined as auxiliary plant chemicals by the Agricultural Code. Registration and proper labeling are required. At the present time the material is registered only for use on ornamental plants and not for use on any food or feed plants. Considerable experimentation was reported by competent plant experts of trials on many field grown crops.

Bureau of Entomology

ROBERT W. HARPER, Chief

STEWART LOCKWOOD, Assistant Chief

The Bureau of Entomology, under provisions of Sections 30, 30.5, 108, 139, 151-153.3, 271-286.5 and related sections of the California Agricultural Code, exercises seven service or regulatory functions in co-operation with other official agencies:

(1) Regular, statewide surveys to detect the early establishment of new insect pests, and to delimit the spread of other important species of restricted distribution;

(2) Eradication programs to eliminate incipient infestations of major insect pests, suppression projects to prevent spread from limited areas of infestation not lending themselves to more drastic eradication action, and protective operations to prevent introduction and establishment of infestation by natural means;

(3) Control programs to reduce crop losses caused by the attack of migratory insects, an activity involving treatment conditions which do not lend themselves to individual grower effort;

(4) Technical advice with respect to commodity or nursery stock treatments involving quarantine regulations and advisory assistance in connection with miscellaneous local insect control problems;

(5) The regular reporting of current insect conditions on a statewide basis by agreement with the U. S. Department of Agriculture, Co-operative-economic Insect Report, and in collaboration with other official agency and industry groups;

(6) Taxonomic identification of insect species involved in quarantine, nursery or field collections;

(7) Supervision of apiary regulations through educational, informational and inspection assistance in support of local regulatory duties.

All bureau functions are dependent upon close working relationships with other departmental agencies, the United States Department of Agriculture, the University of California, county agricultural commissioners, industry, and other groups.

INSECT PEST DETECTION SURVEY

H. T. OSBORN

Specific statewide detection surveys in co-operation with the county agricultural commissioners and the U. S. Department of Agriculture were conducted during 1957 with major emphasis placed on a multiple-purpose trapping program to detect the possible presence of the Mediterranean, melon, Mexican or Oriental fruit flies which constitute a constant threat to California agriculture. Major statewide detection programs were also repeated for the pink bollworm and Japanese beetle.

Survey entomologists also participated in a widespread trapping program to detect spread of the walnut husk fly, and to determine distribution or status of such known pests as the wheat sawfly, pear psylla, spotted alfalfa aphid, European corn borer,

and grape skeletonizer. An intensive survey made in the San Francisco Bay area had the dual purpose of determining the spread of the carnation bud mite, and of detecting the presence of a new and apparently undescribed leaf miner first noticed in San Mateo County in 1956. Survey personnel also participated in survey of a more general nature, being alert at all times to the possibility of discovery in California of new insects of economic importance.

Two insects of major economic importance elsewhere were found for the first time in California in 1957. The sweet clover weevil, *Sitona cylindricollis*, was taken on white sweet clover in Alpine and Modoc Counties in May, and the Rhodes-grass scale, *Antonina graminis*, in Imperial County in October.

Fruit Fly Trapping

Statewide detection trapping, inaugurated in 1956 for Mediterranean fruit fly, *Ceratitis capitata*, following the finding of widespread infestations in Florida, and for melon fly, *Dacus cucurbitae*, subsequent to the taking of a single specimen in Los Angeles in 1956, was expanded and combined into a multiple-purpose detection program to include detection trapping for Oriental and Mexican fruit flies.

At the request of the bureau, tests were conducted by the U. S. Department of Agriculture in Hawaii to determine if the specific male lures for the Mediterranean fruit fly, melon fly and the Oriental fruit fly, *Dacus dorsalis*, could be mixed and used as a combined lure in a single trap in favored host trees or retreats. The results of these tests were reported to demonstrate not only that a mixture of these lures was compatible, but that when combined and used in the Steiner plastic trap, they resulted in captures of each species of fly in numbers as large as when each of the lures was exposed separately.

The mixture, tested in Hawaii and adopted for use in the Steiner plastic traps in California, consisted of oil of angelica for Med-fly, methyl eugenol, Oriental fruit fly, and anisyl acetone for melon fly. DDVP (0.0-Dimethyl 2.2 Dichlorovinyl Phosphate) was included as a necessary knock-down agent in the Steiner dry trap to prevent fly escape through the openings at either end. When oil of angelica was no longer available, Ent. 21486 (Sec-Butyl Ester

of cyclohexene carboxylic acid) also tested successfully, was substituted.

For Mexican fruit fly, *Anastrepha ludens*, the standard glass invaginated McPhail traps were used. These were baited with brown sugar and water with and pyridine added as lure recommendations changed.

Multiple-purpose Trapping

The placing of multiple-purpose fruit fly traps in Northern California was started early in June and maintained into September, with 32 counties participating. It was proposed that half of the traps be placed and serviced by the State, and half by the counties. The traps, predominantly Steiners, were placed in or near host trees, and serviced at weekly intervals. Six district trappers under the supervision of state survey entomologists operated the traps for the State. In Marin, Napa and Sonoma Counties, the state trapping was supervised by the walnut husk fly suppression project. In most of the counties, the area was divided with separate trap lines operated respectively by state and county personnel.

On June 1st, the state melon fly project in Los Angeles County was discontinued, and personnel reassigned to the multiple-purpose fruit fly detection trapping in co-operation with the eight southern counties (Los Angeles, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara and Ventura). Approximately one-half of the traps were maintained by the State, and one-half by the counties. Due to the continued threat of introduction of the Mexican fruit fly, approximately one-half of the traps in this area were the McPhail type and the balance the dry Steiner type.

Trapping was discontinued after October 30th by the State, but was continued at a lower level by some of the counties through the balance of the year, as in past seasons.

Walnut Husk Fly Trapping

Trapping for walnut husk fly, *Rhagoletis completa*, in Marin, Napa and Sonoma Counties was done under supervision of the walnut husk fly suppression project. Outside of this area, a detection trapping program included 36 counties from Santa Barbara and Kern Counties on the south to Shasta County on the north. For this purpose the sticky-carton type of trap baited with powdered ammonium carbonate was used exclusively. Experiments conducted by the



James M. Johnson, Agricultural Inspector, hanging McPhail glass trap baited with brown sugar, yeast and pyridine for detection of Mexican fruit fly

University of California at Riverside demonstrated the standard glycine, lye and water lure in pans to result in larger catches than the sticky-carton traps. However, both types were effective, and for detection trapping in a widespread program the sticky trap has many advantages, is simple to install, and does not necessarily require inspection at weekly intervals. Methods for stamping the holes in the bottom, applying the "stickem," and bending the wires, all mechanically, were developed by Bureau personnel, greatly facilitating preparation of the traps. As in the previous year, an ounce or more of the powdered lure was placed between the perforated bottom and the transposed lid. Instead of being suspended by a wire through the punctured bottom and lid, the wire was wrapped around the carton. Observations made during trapping surveys have indicated an increased capture in traps hung at a horizontal position.

In much of the area, trapping was done by the same personnel handling regular multiple-purpose traps. August and early September were emphasized as the probable peak period in which traps should be in place.

A catch of 400 flies in eight traps in a walnut orchard near Carpinteria represented the first in a commercial orchard in Santa Barbara County. This area is only a few miles from Gobernador Canyon, where flies were first taken in black walnuts in 1956.

Areas of new infestation indicating further northward spread, were found in Santa Barbara, Kern, Stanislaus, Santa Clara and Merced Counties.

Traps picked up flies at several points in the City of Santa Barbara. Extremely heavy larval infestation developed in individual black walnut trees there. Later in September a single fly was taken in a trap at Goleta, and several near Buellton.

In southern Kern County a single fly was captured in Klipstein Canyon, and three flies, one each in Bealville, Keen and Tehachapi. Inspection of nuts failed to confirm establishment of larval infestation such as was found at Frazier Park near the Los Angeles County line in 1955. No additional captures were made in the Bodfish area, even though traps were placed in nearly every walnut tree.

On September 1st, a fly, identified as walnut husk fly, was found in a trap operated by a state trapper just east of Modesto. Immediate inspection by state and county

inspectors revealed a heavy larval infestation in a black walnut tree about 75 yards from the trap. Subsequent inspections revealed additional fly captures and larval infestation radiating from the City of Modesto for some eight miles, one within one-half mile of the San Joaquin county line. An intensive inspection survey, in which most of the county staff participated, resulted in no signs of infestation in San Joaquin County.

The following week, single flies were found in two traps which had been operated by a State trapper in Santa Clara County. A one-day search by State and county inspectors revealed no infestation in the immediate vicinity, but a single infested tree was located within the city limits of San Jose, seven-tenths of a mile from one of the traps, and one and one-half miles from the other. Subsequent survey by county personnel has revealed 12 additional larval infestations within a distance of several miles.

A single fly was captured in a trap operated by one of the State survey entomologists at Le Grand, Merced County, but subsequent inspections have failed to reveal established larval infestations.

In order to establish more accurately the boundaries of infestation in these new areas, maggot surveys were conducted. Approximately 6,000 hosts on 2,000 properties revealed 31 additional infestations. County personnel, under state supervision, expended more than 1,000 man-hours in this effort.

Cherry Fruit Fly Trapping

Except for the Northern California cherry fruit fly project area, trapping for cherry fruit fly, *Rhagoletis cingulata indifferens*, was limited to Alameda, Humboldt, Solano and Sonoma Counties. All results were negative.

Japanese Beetle Trapping

During the period May 1st to August 30th, 21 county agricultural commissioners inspected and serviced Japanese beetle traps weekly or biweekly, using anethole-eugenol as a lure. Civilian and military airports receiving long-distance flights were considered to be major hazards in selecting trapping locations. Traps were also placed out in golf courses, parks and residential areas. Special trapping attention was again given to the International Airport at Los Angeles

because of the capture of one beetle in the approach area there in July, 1951, and another in June, 1954. The Travis Air Force Base at Fairfield was heavily trapped again by the Solano County Commissioner because of the capture of a single beetle there in July, 1956. No Japanese beetles were captured during 1957 at either of these airports or at any other location in California.

Grapeleaf Skeletonizer Survey

During the period May through September, considerable effort was given to the search for grape leaf skeletonizer, *Harrisina brillians*, both within the quarantine area and outside of boundaries of known infestation in San Diego and Riverside Counties. This work was done to obtain current information as to infestation intensities, and to reveal any peripheral spread in support of effective quarantine measures.

County and State forces examined commercial plantings, dooryard grapevines and wild grape, requiring 1,150 man-hours and 7,500 miles of travel for this survey. A total of 9,200 acres of grapes was checked on 142 properties. Commercial plantings involved were located in the Borrego, El Cajon, and Escondido areas of San Diego County, and in the Coachella Valley of Riverside County. Infestations were found in the El Cajon Valley and near Julian, San Diego County, well within quarantine boundaries. Scouting activities in canyon areas and yard inspections in the Hemet Valley of Riverside County continued negative. No extension of infestation was discovered during the 1957 season.

Skeletonizer parasitism by *Sturmia harrisinae* and *Apanteles harrisinae* totaled 63 percent in one area of San Diego County.

Citrus Whitefly Survey

Field work in connection with citrus whitefly, *Dialeurodes citri*, was confined to surveys confirming eradication. The third and final annual inspection of the infested area in the City of Madera was completed without record of a positive find of the insect. Several "buffer" blocks adjacent to known infestation, and certain others supporting liberal plantings of citrus whitefly hosts, were also inspected, with negative results.

A total of 672 hosts on 273 properties in 66 city blocks was covered, and it may be assumed that this infestation has been eradicated.

In the search for new infestations, restricted surveys for citrus whitefly were made in the Hemet-Elsinore section of Riverside County, and in Kern County in the vicinity of Edwards Air Force Base and Boron.

Pink Bollworm Detection

The annual survey to detect possible presence of the pink bollworm, *Pectinophora gossypiella*, was made again with major reliance placed on the gin trash inspection which was for many years the principal detection method recommended by the U. S. Department of Agriculture. With increasing difficulty in securing satisfactory first-clean trash from many gins, the desirability of supplementing the gin trash inspection by other methods has increased. For this reason boll inspections, made for the past several years in California, were repeated this year. The inspection of early season blooms before bolls are present has been receiving greater attention by the U. S. Department of Agriculture, especially in Texas. A limited amount of this type of inspection, done in California in some previous years, was greatly expanded during 1957 by the U. S. Department of Agriculture inspectors, particularly in the Imperial Valley. A report of possible pink bollworm infestation in the west coast Mexican State of Sinaloa has greatly increased the threat to Imperial Valley plantings.

A somewhat smaller total number of bushels of gin trash was inspected during the present season than during the past several years. However, with more careful selectivity of the gin trash collected from a smaller number of gins, it is believed that the results were fully as satisfactory. An effort was made to start the gin trash inspection earlier, particularly in the Imperial Valley and Kern County. This move resulted in the obtaining of excellent trash before temperatures in driers had been increased. Due to the exceptionally mild fall, excellent trash was still being obtained in San Joaquin Valley gins through November 22d, when all gin trash inspections were discontinued.

A total of 16,595 bushels of gin trash, 118,060 green cotton bolls and 1,047,803 cotton blooms were examined in 10 California and two Nevada cotton-growing counties.

No pink bollworms were found by any of the inspection methods used in California during the year. No established infestations have ever been found in California.

Indicative of the amount of inspection done is the report of 8,839 man-hours by state, county and federal inspectors in making the gin trash and field inspections, which required 44,149 miles of travel.

Wheat Sawfly Survey

Surveys for wheat sawfly, *Pachynematus sporax*, were repeated in the suppressive area in the Cuyama Valley and in surrounding wheat areas in Santa Barbara, San Luis Obispo, Kern and Ventura Counties. No adult flies were taken this year. First eggs were found on March 19th, and first larvae on March 21st. In all, eggs were found in eight fields. No infestations were found outside of the suppressive zone.

Fields in which infestation was found contained an estimated 1,240 acres, a large part of which consisted of volunteer plants in fallow fields. Grassy "potreros" in the mountains above the Cuyama Valley in Santa Barbara and Kern Counties were surveyed for the first time in April, and although several species of sawflies were collected, no wheat sawfly was found. Wheat fields in Monterey, Napa, Tulare, Fresno, Mariposa and Los Angeles Counties were inspected, but no wheat sawfly found.

Survey in Sierra mountain counties in May and June resulted in the collection of a sawfly larva from several grass species which closely resembles the wheat sawfly, *P. sporax*. This same larva was found by Agricultural Commissioner Loring White in Modoc County on several species of grass in 1956, but not on wheat. On visiting these localities this year, larvae were found readily in beardless wild rye, *Elymus tritiooides* at Alturas, in intermediate wheat grass, *Agropyron intermedium* near Cedarville, but none was taken in a wheat field heading out only 100 yards away nor were collections made from beardless rye in Lassen, Plumas, Alpine and Sierra Counties. A comparison of these larvae with those from Cuyama has revealed slight differences, but the taxonomists believe these are not sufficient on which to base definite specific separation.

A total of 720 man-hours (524 State, 196 county) was devoted to wheat sawfly survey.

Miscellaneous Surveys

During the period January through April, a survey was made in eight counties to locate infestations of carnation plantings by the carnation bud mite, *Aceria paradiantshi*, which had recently appeared in the San Francisco Bay region, and to detect the possible presence of a carnation leaf miner, *Liriomyza* n. sp., reported in San Mateo County, which appears to be an undescribed species and which is possibly of foreign introduction. Inspections were made of glass houses of 121 growers. Fourteen (14) infestations of the bud mite were found, five in Alameda, three in San Mateo, five in Santa Clara, and one in San Joaquin Counties. None was found in Contra Costa, San Francisco or Santa Cruz Counties. Evidence of the leaf miner was found in five houses in San Mateo, but none elsewhere. The inspections required 278 man-hours by the State, and 345 by the counties.

In the course of survey during the last week of June by two state survey entomologists in Alpine County, 40 specimens of a sweet clover weevil, *Sitona cylindricollis*, were swept from volunteer white sweet clover plants in Diamond Valley. Subsequently *Sitona* weevils were collected at several points from white sweet clover plants along roadsides in the Woodfords' area. Since the foreign sweet clover weevil was reported in Washoe County, Nevada, late in 1956, it was expected to be found in California this year, in view of the rapid spread from the midwest during the past several years. Credit for the first collection, however, goes to County Agricultural Commissioner Loring White, who submitted specimens which he had collected on white sweet clover at Alturas on May 27th. The specimens were identified in Sacramento and confirmed in Washington, D. C. Survey during June in Lassen, Plumas and Sierra Counties failed to reveal infestation, but specimens were collected at Coleville in Mono County on June 21st.

Rhodes grass scale, *Antonina graminis*, was first identified in California from specimens submitted by the county agricultural commissioner of Imperial County from a lawn of St. Augustine grass, *Stenotaphrum secundatum*, at El Centro on October 13th. Subsequent survey located additional Augustine lawns infested in El Centro and Holtville. Collections were made from Bermuda grass as well. Evidence indicates the

TABLE 1

SUMMARY

INSECT TRAPPING TOTALS—1957

Detection program	Number traps			Man-hours		Trap servings	Mileage	
	County	State	Federal	County	State		County	State
1. Mediterranean-Oriental-melon fruitflies								
Northern California	1,155	1,195	---	3,738	5,471	26,797	36,502	74,811
Southern California	945	956	---	6,125	5,317	63,984	58,147	47,758
Melon Fly Project (Los Angeles)	850	5,348	1,000	2,664	10,928	93,392	18,907	47,703
Total	2,950	7,499	1,000	12,527	21,716	184,173	113,556	170,272
2. Mexican fruit fly								
Northern California	111	192	---	---	---	---	---	---
Southern California	945	894	---	---	---	---	---	---
Border project (San Diego-Imperial)	---	1,355	2,338	---	7,771	148,852	---	19,687
Total	1,056	2,441	2,338	---	---	---	---	---
3. Walnut husk fly								
Central and Northern California	2,196	1,846	---	---	---	---	---	---
Sonoma-Napa project area	948	4,784	---	556	1,849	30,000	---	16,041
Total	3,144	6,630	---	---	---	---	---	---
4. Cherry fruit fly								
Northern California	106	---	---	---	---	---	---	---
Siskiyou project area	---	936	---	---	3,277	8,000	---	26,557
Total	691	---	---	---	---	---	---	---
5. Japanese beetle								
Total Traps	7,947	17,506	3,338	---	---	---	---	---

Statistics for Programs 2-3-4, except project area data, included in Program 1.

infestations have been present for a considerable period of time.

No specific statewide survey was made for European corn borer, *Pyrausta nubilalis*, this year, but several counties have made inspection of corn fields with this insect in mind. The state survey entomologist in the north participated in the survey in Glenn, Sacramento, Shasta, and Yolo Counties. In Southern California, Los Angeles, Orange, Riverside and San Bernardino Counties have continued field inspection for corn borer, particularly in the vicinity of facilities for receiving corn from the infested midwest localities. Several southern counties also put out a limited number of sugar and water traps. No indications of European corn borer were found in any locality in California.

Spread of the pear psylla, *Psylla pyricola*, has continued. Reports of established in-

festations were made for the first time in Solano, Yolo, Contra Costa, Alameda, Santa Clara and Sacramento Counties, all in the Sacramento Delta or San Francisco Bay areas.

The spotted alfalfa aphid, *Therioaphis maculata*, has spread to include all of important alfalfa districts except Modoc County in the extreme northeast. Survey entomologists and county inspectors found the aphid for the first time at Middletown, Lake County, at Hopland in Mendocino County, at Susanville, Lassen County, and at Placerville, El Dorado County. The Siskiyou County Agricultural Commissioner submitted specimens, identified as this species, collected near Montague. The species has spread from one end of California to another in less than four years.

INSECT ERADICATION, SUPPRESSION AND PROTECTIVE PROGRAMS

Insect pests of major economic significance which currently lend themselves to eradication, include spruce needle miner, Khapra beetle, cherry fruit fly, and Hall scale. The walnut husk fly has been subject to suppressive effort, while Mexican fruit fly operations have been of a protective or preventive nature. One of these programs, spruce needle miner, was inaugurated in 1957, while another, walnut husk fly, was terminated.

Spruce Needle Miner, *Taniva albolineana* (Kearf)—Alan G. Forbes

Samples of mined spruce needles collected by the County Agricultural Commissioner of Modoc County on February 15, 1957, from Alturas, and the subsequent emergence of adult moths of the spruce needle miner, *Taniva albolineana* (Kearf) provided the first record of the occurrence of this insect in California.

Property owners in Alturas, becoming alarmed at the damage and unsightliness of their trees, requested aid from the county agricultural commissioner. Initial reconnaissance indicated the probability that the infestation was confined to the City of Alturas. To prevent possible buildup, a malathion spray was applied in April to 228 trees on 97 properties, using 534 gallons of material, an average of two and three-tenths (2.3) gal-

lons per host. The formula consisted of one and one-half (1½) pounds actual malathion per 100 gallons of water.

At this point the bureau was asked to investigate the problem. Following an appraisal of the situation, a full-scale eradication attempt was decided upon. Factors entering into this decision were the known pest status of the insect on ornamental spruce plantings, its apparent restricted distribution in California and adjacent states, and the small possibility of natural spread either into the State or from the Alturas area. Host trees in the area are limited to ornamental yard plantings, the nearest native spruce reportedly occurring on the western slope of Mt. Shasta, approximately 90 miles west of the infestation.

No infestation outside of Alturas has been discovered, excepting one small tree in the Surprise Valley, originating from an infested nursery in Alturas. Co-operative state-county surveys to date have used 40 state and 52 county man-hours; 612 state and 250 county vehicle miles. A total of 353 spruce trees on 260 properties were inspected, most of them in Alturas.

Based on the life history of the insect, a full coverage spray was applied in May, timed to precede the expected oviposition dates of emerging adults. Spray materials employed, provided by the county, consisted



Injury resulting from spruce leaf miner attack. Twig terminals removed to show basal accumulations of frass and appressed needles.

of DDT, 25 percent wettable powder, eight pounds per 100 gallons of water, to which was added one quart of summer oil emulsion.

A total of 24 state and 48 county man-hours was used in treating 279 host trees on 130 properties. Twenty-four hundred (2,400) gallons of spray were applied, an average of eight and six-tenths (8.6) gallons per host tree.

Results of the treatments were thoroughly satisfactory. Examination of infested trees throughout the summer showed no live insects or fresh mines. Barring more widespread positive finds in neighboring areas, it may be assumed that following additional treatments the insect can be eradicated successfully.

Khaphra Beetle, *Trogoderma granarium*— Earle T. Gammon

The outstanding developments in this eradication program during 1957 were: (1) efforts to determine the causes of several failures in property fumigation, and to strengthen procedures so that such failings would be reduced to a minimum; (2) the presentation of a planned program for current and future detection efforts; and (3) the increased emphasis placed on detection activity in the later months of the year as fumigation activities declined.

Status of Infestation

As of January 1, 1957, a total of 280 properties had been recorded as infested with Khaphra beetle in California. The cubic footage involved in the elimination of infestation from these properties was 71,338,331 cubic feet.

During 1955 and 1956, 260 of these properties were treated by overall fumigation, spraying, sanitation, or other means, and released from infested status. The estimated volume of the properties treated was 66,688,264 cubic feet, leaving a balance at the beginning of 1957 of 20 properties with an estimated cubic footage of 4,650,067 feet to be fumigated.

During 1957, intensive inspection revealed 37 new properties, an additional 9,140,706 cubic feet, infested with Khaphra beetle, for a grand total of 317 properties and 80,479,037 cubic feet.

In addition to these 37 new finds, 13 properties, measuring 5,294,120 cubic feet, previously treated and released from infested status, were found to have live Khaphra beetle. It was definitely determined that seven of these resulted from reinfestations, while the continuing infestation in the other six was probably due to fumigation failure.

This situation led to further strengthening of eradication procedures by additional revisions in fumigation techniques. Changes in operating procedures initiated in 1956 sought to overcome any shortcoming that might be responsible for the failures. These changes included an increase in the number of sampling stations and recirculation units in bulk commodities.

Changes in Treatment Procedures

Following the discovery of additional failures early in 1957, and after several conferences and discussions with co-operating personnel, a number of other more stringent measures were inaugurated. These include: (1) maintenance of very high overhead or space concentrations (50 ounces or higher per 1,000 cubic feet) throughout the entire 48-hour exposure period, even though the minimum requirements of 32 ounces for 24 hours had been met at all points; (2) fumigate larger ground areas around heavily infested buildings or bins; (3) wherever possible, break up all caked masses of grain or feed before fumigation (in some instances this operation would require the complete emptying of a tank or bin); (4) check

Gow-Mac or Fumiscope thermal conductivity units frequently, both against other recently tested instruments and by chemical analysis; (5) take readings in grain masses with high insect populations or in the presence of chicken or cattle litter before the introduction of methyl bromide to determine if carbon dioxide was present in significant amounts, inasmuch as carbon dioxide influences thermal conductivity instruments in the same manner as methyl bromide, and if present in significant amounts, registers high erroneous concentrations; (6) rake together and fumigate more debris rather than burn (debris piles often fail to burn completely and Khapra beetle survive); (7) require dual methyl bromide or pipe introduction lines into all areas where distribution of methyl bromide might be difficult or slow, thus decreasing the chance that bursting lines would prevent proper introduction of the fumigant; (8) require contractors to have their tarpaulins available three days before the actual covering action so that they may be tested and marked.

So far as is known, we have had no fumigation failures since inauguration of these measures in June of 1957.

As a result of the tarpaulin testing provisions decided upon, it became necessary to devise a practical testing method. In 1956 the U. S. Department of Agriculture, Stored Products Section, Agricultural Marketing Service, and state personnel, put in considerable time devising such a method, and in 1957 further perfected it by field trial. A pressure test based upon the rapidity with which an inflated tarpaulin envelope would collapse under the pressure of a 15-pound weight was finally adopted. Through its use poor fumigation jobs due to leaky tarpaulins have been reduced to a minimum.

Detection Program

Detection plans called for 1957-58 Fiscal Year inspection of all Type I properties (recorded infestations) three times, all Type II properties (sellers or distributors of stored products) twice, and all Type III properties (stored products strictly for on-farm use) once. At intervals the program would be subject to re-evaluation and revision to project the plan into the future as developments warranted.

In connection with the detection plan, all agricultural commissioners were requested to provide their best estimate of

the number and size of the various type properties in their respective counties. Based on the formula assignment of man-hour inspection needs for each type and size property, the total man-days necessary to complete the assignment in each year was computed. With more than 65,000 properties involved, manpower requirements totaled approximately 24,000 days for 1957-58.

It was suggested that the U. S. Department of Agriculture, Khapra Beetle Control Project, contribute one-half of the needs, the counties and State providing the other one-half on a matching basis. County response to this proposal was very satisfactory, many counties assuring the bureau they would do all or more than their share. However, joint funds were not sufficient to complete this program. Consequently, a revised detection program was necessary. Following several meetings with representatives of collaborating agencies, a revised plan for 1957-58 was adopted which it was felt had a reasonable chance of being carried out with available funds and personnel. In short, the revised plan called for inspection as originally planned in all key counties, with a lesser amount of attention to "fringe" counties. Inspection in the latter instance would be confined in the main to Type II properties with perhaps a limited amount of selective inspection of some of the more important Type III properties.

A key county was defined as one in which infestation had been recorded, or one which, because of proximity, or because of heavy host commerce, might be likely to have become infested. "Fringe" counties would, in the main, include all north coastal and mountain counties. As of the end of the year, prospects appeared bright for successful completion of such a detection program, providing all available man-power is utilized to the best possible advantage.

Participating Agencies and Program Costs

The Khapra beetle project continued as a truly co-operative effort between the several participating agencies: In general, the U. S. Department of Agriculture, Plant Pest Control Division, Agricultural Research Service, furnished the bulk of the methyl bromide required. It assumed the major responsibility, together with county personnel, for detection activities, although the bureau participated in this work on an ever-increasing scale as property fumigations became

less numerous. The bureau assumed major responsibility for property fumigations, paid the main costs of contract coverage, and furnished most of the malathion and diesel oil required in connection with property cleanup. The U. S. Department of Agriculture, Stored Products Insect Section, Agricultural Marketing Service, assigned an entomologist full time to research problems, and to assist on property fumigations. The University of California at Riverside also continued with the assignment of several entomologists to research studies. Counties contributed heavily to detection work, to a lesser degree to property fumigations, while considerable of their personnel's time was given to necessary quarantine activities.

Some basic costs of treatment operations roughly indicate the scope of the project during 1957 as follows: contract coverage, \$94,500; methyl bromide, \$59,000; malathion, \$5,000; diesel oil, \$5,500.

Reports by the three agencies, federal, state and county, for the six-month period July-December, 1957, show over 37,750 man-hours expended in making 17,585 property inspections. It is interesting to note that 21 infestations were found during this second half of the year, with an expenditure of 1,797 man-hours per infestation, or a cost of approximately \$3,325 for each such find.

During 1954, an infestation was found for each 50 property inspections; in 1955, one for each 125; in 1956, one for 400; in 1957 as a whole, one for 615. In the last half of 1957 the figure rose to one infestation for each 840 property inspections. These data tend to show that more effort and greater expenditures will be needed for detection phases of the program, while correspondingly less should be needed for contract fumigations, fumigants and spray materials.

Program costs to the department for Khapra beetle work in 1957 were approximately \$137,000, exclusive of administrative expenses. The U. S. Department of Agriculture, Plant Pest Control Division, Agricultural Research Service, expended \$270,000, while the Stored Products Insect Section, Agricultural Marketing Service, spent approximately \$10,000, basically for research purposes. The University of California at Riverside expended a comparable amount for research. It is estimated that the counties spent an estimated \$75,000, mostly for detection and quarantine activities. Total

expenditures show an overall Khapra beetle cost for the year of approximately \$500,000 as compared with approximately \$750,000 during 1956. Average annual expenditures represent a small percentage of the return to growers of host crops each year.

Wheat Sawfly, *Pachynematus sporax*— M. L. Jones

Cuyama Valley portions of Ventura, Santa Barbara and San Luis Obispo Counties involved in the eradication of the wheat sawfly, *Pachynematus sporax*, were again treated with DDT, one pound actual in one gallon of diesel oil per acre. Embraced by these activities were all wheat, barley, volunteer, and summer fallow fields located from approximately three miles west of Perkins Road on the west end of the Cuyama Valley to one-fourth mile east of Highway 399 on the east and south to Lockwood Valley, which is 12 miles south of Ventucopa. This season was the fourth consecutive year since initial application efforts were inaugurated in 1954.

The first of two scheduled applications was started April 9th, and concluded April 12th, with a total of 20,400 acres covered. Prior to spraying, positive collections of the sawfly were made in Goode Canyon in the center of known infestation. As an added precaution 1,000 acres in this sector included in the above total were resprayed. In addition to the treatment of cultivated lands, where possible, all roadsides, ditch banks, and headlands were sprayed. Two airplanes, flying at 25-foot elevation and covering a swath of 100 feet, were used. An average of three flagmen was employed to insure complete coverage.

The second spraying of the area started April 22d, and was completed April 25th, covering a total of 19,320 acres. Before the second application was begun, a new field in the Ventucopa area was found to be infested. It was covered in the second spray, and later resprayed as a precautionary measure. A grand total of 39,720 acres was treated.

Cherry Fruit Fly, *Rhagoletis cingulata*— M. L. Jones

Seasonal activities with respect to the eradication of the cherry fruit fly, *Rhagoletis cingulata*, in western Siskiyou County, started the first part of May with the application of soil insecticides. Dieldrin at the rate of 16 pounds actual to the acre, or one

pint 50 percent dieldrin to 100 gallons of water, at the rate of one and one-half gallons per square yard, was applied to soil areas beneath 26 host trees on 14 properties in the City of Yreka.

At the start of the season the Yreka area was the only remaining location involved in treatment operations, the current season marking the fourth and last of a series of consecutive spray treatment since live cherry fruit fly was collected there.

Subsequent to soil treatments, a series of foliage applications was made at 10-day intervals to all host trees in the City of Yreka. This operation extended throughout the fruiting period. A total of 10 applications was made to 141 cherry trees on 86 properties. Methoxychlor, 50 percent wettable, at the rate of three pounds to 100 gallons of water, was used as the cover spray. An average of two gallons of spray was applied to each tree. All spraying, contracted by the County of Siskiyou with a local pest control operator, was supervised by State personnel.

Fruit sampling started on May 20th, collections coming from host trees in four counties. Many areas failed to mature fruit because of low temperatures during the blooming period. However, a total of 379 quart samples of fruit was collected from 218 properties. This work resulted in discovering an established infestation of cherry fruit fly on a ranch northeast of Montague, in the Willow Creek area of Siskiyou County. A dieldrin soil treatment was applied immediately to seven host trees on three properties. This effort was followed by methoxychlor treatments to the same host plantings at 10-day intervals, until the end of the fruiting season.

Adult cherry fruit flies were trapped late in the season from 16 widespread properties in Siskiyou County, and one location at Weitchpec, Humboldt County. These collections are assumed to represent specimens of the native cherry fruit fly variety emerging from wild bitter cherry, *Prunus emarginata*, and, although their presence should not influence the outcome of the program, locations involved will be closely watched next season to verify their true status.

Hall Scale, *Nilotaspis halli*—E. H. Fosen
(U. S. D. A.)

The co-operative federal-state program pursuing eradication of Hall scale, a serious pest of stone fruit, has entered its final

phase, that of confirming successful elimination of the species in California. The treatment program, started in 1941, has now been completed following three consecutive fumigation treatments in all known infested areas. Surveys during this period revealed 10 infestations, seven in Butte County, and three in Yolo County. In completing the treatment program, 48,946 host trees have been involved. Of these, 17,784 were removed and destroyed, leaving a balance of 31,162 which were treated by fumigating with HCN under gastight tents. Approximately one and one-half million dollars has been expended on this project.

During the period 1941 through 1957, a total of 949,624 host trees was examined on 38,723 properties. The majority of these inspections were located in the vicinity of Chico, although all known host material moved earlier from this locality to areas throughout California and as far as the Gulf states were traced and examined. Surveys resulted in the finding of 2,960 infested hosts in the 10 areas, all in California.

Inspection Activities

During the year, inspection activities were intensified by the addition of five temporary state employees to assist the regular federal inspectors. Host examinations were made in the Chico rural and city areas within a half-mile radius of infestation. Reinspection of the towns of Durham, Gridley and Biggs, was completed. Dooryard hosts in these cities were originally inspected when it was believed that scion wood from the U. S. Plant Introduction Garden might have been transported there.

Upon the discovery of a light infestation in June of 1956 on a property in the City of Davis, it was disclosed that scion wood from this property had been used in an experimental nursery planting in Solano County near Davis. This nursery property was checked last year, with negative results. In rechecking it during the current year, it was found that the trees in question had been destroyed, so other adjacent hosts were inspected. The university grounds were also checked.

A tree-by-tree survey within a half-mile periphery of the Rath infestation area of Chico was instigated this year. In the past, only the adjacent properties were given a complete inspection. In the balance of the area, one-fourth of the trees were examined. It is estimated that 41,000 orchard trees will

be involved, and that inspection will be completed in 1958.

The 12 buffer blocks of the Oroville city treatment area were given a second inspection this past year. A grand total of 42,600 host trees on 3,029 properties was inspected during 1957 in all areas. No Hall scale finds were made.

Post fumigation inspection was confined to infested properties, which received the third and final treatment. This treatment included the third and final post fumigation inspection of the U. S. Plant Introduction Garden, Bidwell Park, Stilson Canyon, and the first Davis infestation area. Treatment areas in the Cities of Oroville and Chico were inspected. A total of 22,011 post fumigation inspections on 164 properties was made without discovery of live scale specimen.

Fumigation Activities

Fumigation for 1957 was started October 14th, concluded on November 15th, in the Cities of Davis and Chico, completing all scheduled treatments. Two crews were utilized, consisting of 15 state seasonal personnel to assist the regular federal field men. Hand poles were used in covering the trees with gastight tents, with the exception of one orchard planting. This orchard of 139 large almond trees required the use of boom trucks.

As in the past, the fumigation treatment has continued to follow the 35 cc. unit schedule, with an exposure period of 50 minutes. A total of 1,849 hosts on 425 properties was fumigated with HCN without an accident or any unusual incident. Average concentration of gas was checked throughout the treatment season. A total of 37 samples was taken from tents in field use. Titration of these samples showed an average of 6.22 mg/HCN maintained. Average loss of gas was 6.70 percent over an exposure period of from five to 40 minutes.

During the course of the fumigation, 88 unwanted trees were removed, at the owners' request, from properties under treatment. In addition, 2,150 volunteer seedlings were located and destroyed within the areas of infestation.

Walnut Husk Fly, *Rhagoletis completa*—

Alan G. Forbes

The walnut husk fly suppression project in Sonoma and Napa Counties was continued through the 1957 season, having at

its objective the depression of known populations and the detection of spread to new areas. The program was initiated in June with the installation of trap lines and soil applications of dieldrin under all trees where larvae had been recorded in 1956. Foliage spraying, using malathion-yeast or malathion-Staley's saucebase formulations, began in early July. In order to maintain a stepped-up spray schedule, and to incorporate into the program new areas of infestation, another spray rig was added to the equipment complement, while all acreage as well as creekside trees were sprayed by air.

Late season finds in 1956 had increased the areas in Sonoma and Napa Counties, where treatments were necessary for the prevention of further insect spread. To the northwest in Sonoma County's Sonoma and Bennett Valleys, new properties were readily incorporated into existing spray operation, since finds were made bordering the western treatment boundary. A total of 2,276 properties has been recorded in the Sonoma County treatment area. Two widely separated sites in Napa County, one including a section of Calistoga, the other near St. Helena, nine miles southeast, encompassed areas two miles in diameter and 273 properties.

Treatment Operations

To minimize the emergence of adult flies, the ground under all host trees where larvae had been recorded the previous year was treated with a soaking spray of dieldrin applied at a calculated dosage of five pounds actual toxicant per acre. Host trees within a three-mile radius of Bodfish, Kern County, where an adult husk fly had been taken in late August of 1956, were located and, although no larval infestation had ever been recorded from this area, a soil application was employed under all trees large enough to bear fruit.

Similar ground sprays were initiated in the Sonoma control district during the final week of June, and continued throughout the season, wherever larval infestations were recorded. Soil treatment on properties recorded as infested in 1956 and on new properties recorded in 1957 involved a total of 5,930 gallons, 11,380 square yards, and approximately 165 man-hours. A total of 30 hosts on 12 properties was involved.

Three methods of foliage spraying were in use during 1957, conventional hydraulic sprayers, a mist blower and a helicopter. In

use for the first time on the walnut husk fly project, the helicopter proved satisfactory for close flying along creeks and small orchards where obstruction would limit a fixed wing craft. Two of the outstanding features were the rapidity of treatment and the accessibility of otherwise unapproachable walnut trees growing along the banks of Sonoma and Napa Creeks.

Four applications of malathion-Staley's saucebase were made to approximately 580 acres of planted orchards and an estimated 170 acres of creek bank containing small stands and isolated black walnut trees. The formula, consisting of four pounds 25 percent malathion wettable powder and two quarts saucebase in three gallons of water, was mixed at the flight strip in nurse rigs, and pumped directly into the helicopter. Six flight strips were used in Sonoma County and two in Napa County. Spray was applied at the rate of three gallons or one pound actual malathion per acre. A total of 10,505 gallons of mixed spray was used.

Bait spraying with ground rigs was begun in early July, operating from headquarters in El Verano, Sonoma County, and Napa in Napa County, both bases being provided by the county agricultural commissioners concerned. By mid-July the program was in full swing.

A total of 73,920 gallons of bait spray was applied to 89,403 hosts on 7,968 properties. Application rate averaged 0.82 gallons of material per host tree.

Trapping Surveys

Survey in the three counties of Marin, Napa, and Sonoma was initiated in June as a project responsibility, with the county agricultural commissioners participating.

The first adult was captured in Sonoma County at Boyes Springs on July 15th in a trap placed in an English walnut tree. This find was not unexpected, since the Boyes Springs site was near the center of infestations recorded in the previous two years. Considerably more disturbing was the find two weeks later of a single female in a trap near the Enterprise School on Dry Creek Road in Napa County. This site, about two and one-half miles east of the Sonoma County line, implied the possibility of a hitherto unknown infestation in mountainous terrain separating the Sonoma and Napa Valleys.

Trapping was immediately intensified in this mountainous district, and by mid-August six additional sites of infestations had been recorded from Napa County within 15 miles of the original find.

The last date on which an adult fly was taken in Napa County was September 19th. A total of 25 flies was recorded from 11 properties, repeat collections being made on two of them. No collections were made within the boundaries of either of the original Napa County control areas.

Sonoma County records indicate 114 flies from 38 collections on 29 properties, nine properties having one or more repeat collections. Larval infestations were found on three properties. One was missed in the previous season's mapping, and consequently had received no insecticidal treatment prior to 1957. Positive catches of husk fly in Sonoma County, with two exceptions, were confined to the Sonoma Valley. A single record was made on the Sonoma Mountain Road three miles west of Glen Ellen. This catch, a single female with no egg development, was made on the same property on which a positive record had first been made in 1956. A single male fly, taken near the intersection of Sharp Road and Calistoga Road in east central Sonoma County, less than 200 yards from the Napa County line, proved to be the northernmost point at which specimens were confirmed in 1957.



Frick or sticky-carton trap baited with ammonium chloride showing catch of adult walnut husk fly

Directed survey throughout the central valley, coastal and mountain counties north of the Tehachapi Mountains was conducted beginning in July. This work, distinct from project survey in the control area, was carried out as a function of the insect survey group. These efforts resulted in the almost concurrent discovery of limited but geographically widespread infestations of the walnut husk fly in several central valley and coastal counties. These finds, made during September, indicated that the insect was moving slowly northward from its previously known range in Southern California. No physical factors to contain or restrict natural spread were inherent in any of the new infestation sites. This fact, coupled with the thriving local trade in black walnuts picked up along roadsides, and over which little control could be exercised, plus the number of localities implicated, underlined the economic impracticability of continued control effort, and ruled out the possibility of eliminating the insect from its new habitat in Northern California.

Melon Fly, *Dacus cucurbitae*—Ronald Hawthorne

The melon fly project operated as such from August, 1956, until June, 1957, when it was redesignated to include the detection of other fruit flies which are of potential threat to California agriculture and coordinated with the general survey unit.

The project operated from headquarters established in Santa Monica, and covered an area within a five-mile radius of the University of California, Los Angeles Campus, where the single melon fly specimen was taken in a McPhail trap in July, 1956. On the first of January, 1957, trap numbers operated by project personnel were reduced from approximately 8,000 to 5,500 in keeping with the master plan of operation agreed upon. This plan was based on continued negative findings and a corresponding reduction of traps as the period of time extended through the possible fourth generation of the insect species. Glass McPhail traps and the bucket type fiber pots were used. These were baited with anisyl acetone, water and an emulsifying agent, monolaurate.

Trap reductions again were made in April to approximately 4,000, and in June to a theoretical zero with the closing out of the melon fly trapping program as such, and the commencement of multiple fruit fly

trapping. During the June change-over, several hundred melon fly traps were in operation. Throughout the program, a system of rotating traps from one property location to another at regular intervals was maintained to emphasize maximum coverage. Approximately 3,500 to 5,350 properties were initially involved, increasing from 4,200 to 8,800 as the rotation process progressed.

During the period January to June, more than 34,000 insect specimens were submitted from melon fly traps. Several native fruit flies, of no economic importance, but of interest for distributional records, were taken. More than 87,000 servicings of melon fly traps were made during this period. No further melon fly collections were made.

In co-operation with the United States Department of Agriculture and the Los Angeles County Agricultural Commissioner, trap coverage was extended throughout the county. Federal Government operated melon fly traps adjacent to the intensive state-trapped area, and south to San Pedro, until April, then moved to the San Diego-Mexican border area and Imperial Valley from April to June, 1957, when their melon fly program participation was discontinued. Los Angeles County maintained traps over areas not covered by the other co-operating agencies. Most of the agricultural commissioners in other Southern California counties also maintained smaller numbers of melon fly traps during the entire program period with traps and lures provided by the State.

Mexican Fruit Fly, *Anastrepha ludens*—

D. W. Robinson

Treatment and survey efforts directed by federal-state-county agencies against the Mexican fruit fly, *Anastrepha ludens*, continued throughout 1957. Despite seasonal records indicating extremely heavy infestations of the fly on the Mexican mainland, and despite the trapping of many adult flies along border areas of Baja California and adjacent San Diego County, these co-operative efforts were again successful in preventing local establishment of infestation. The threat of this major pest continues to stem from the movement of infested contraband fruit from the Mexican mainland in violation of quarantine regulations.

Program functions assigned to the various agencies concerned remained basically the same as in past years. The U. S. Department of Agriculture maintained survey pro-

grams in Baja California, California, and Arizona, and continued the treatment program in Baja California; provided spray material for the State's treatment program, and operated research and quarantine facilities in Mexico.

Treatment Operations

The California Department of Agriculture maintained a near saturation trapping survey in border areas near San Ysidro, carried out eradication measures in areas within one mile of positive finds in California, and bait-spray treated all hosts in a barrier strip 5-7 miles wide along the entire southern boundary of San Diego County. San Diego County and other California counties, in co-operation with the State, maintained detection surveys for Mexican fruit fly in areas more distant from the border. San Diego County through the San Diego County Agricultural Commissioner, also assisted in various other phases of the state and federal programs by supplying both equipment and manpower. Co-operative agreements as to policies affecting the programs were enhanced by a number of joint meetings during the season, and led to a number of changes in program operations.

The bait spray formula for host tree treatment consisted of a mixture of eight pounds of 25 percent wettable malathion and two pounds of partially hydrolyzed yeast in 100 gallons of water. An average of 0.1 gallon of spray per tree was used. The number of complete area treatments applied to hosts in the buffer zone totaled 17 for the year, making an aggregate total of 251,439 host sprayings, requiring 38,403 property visits, and 25,300 gallons of spray mix. Regular bait spray treatment remained at three-week intervals, except during and following the period of high adult catches, when treatment intervals were reduced to two weeks in the eradication area. It was agreed that spray applications might be discontinued from December to March without impairing program goals. On this premise, treatment in Baja California was discontinued after the end of November and in California after the 70th consecutive application was completed in mid-December.

The treatment of nonhost trees was stepped up about mid-year as an added precaution. Acreages covered in the air application were increased to 250 acres as compared with 180 acres per application under

the 1956-57 contract. The insecticide formula used on nonhost trees and shrubs substituted saucebase for the yeast on a pound for pound basis. This formula was used also for airplane treatment of canyon shrubs. Methoxychlor at eight pounds of 50 percent wettable in five gallons of water per acre for canyon use was substituted when available. Because of adverse side effects upon other insect populations, it was not employed for host tree treatments. The aggregate total of nonhosts sprayed was 5,086 trees on residential properties, 32,836 trees and 204 miles of roadside growth, and 2,690 acres of canyon bottom brush. Canyon bottom brush, treated by airplane, required 17,450 gallons of spray mix while ground treatments required 38,048 gallons of spray.

The treatment of the soil under all host trees within a quarter mile of properties on which positive finds had been recorded in previous years was repeated during April. The formula of one-half pint of 19 percent endrin emulsifiable concentrate in 100 gallons of water was used at the rate of about one gallon per square yard to give the approximate equivalent of four pounds actual per acre. This spray was applied to soil under hosts in additional areas around new fly catches as they were recorded, extensions being, as in the past, on the basis of one-quarter mile radius around positive finds. These treatments required 27,150 gallons of spray mix and 556 state and 522 county vehicle miles. The treatment is designed to saturate the top several inches of soil with a residual insecticide effective against any larvae or adult flies passing through the soil. In locations where human or animal hazards existed, the spray was washed off ground cover with clear water. Soil treatment for 1957 totaled 26,200 square yards under 1,393 trees as compared to 2,850 square yards treated under 547 trees during 1956. The host trees in about two-thirds of the town area of San Ysidro were included in this treatment, which required 520 man-hours.

Detection Activities

The State's trapping and fruit inspection program was continued in a three-mile wide and 13-mile long area making up the southwest corner of San Diego County. In eradication areas consisting of two-mile diameter circles around positive finds, the survey was maintained on a near saturation basis, as

in past years, with 968 traps in operation on 302 properties. Outside of these areas, trapping was less intensive in nature, 387 traps on 100 scattered properties including those in canyon areas. Trap servicing was maintained on a weekly basis, except for the shortening of this interval during the mid-season period, when many flies were being caught, and when drying winds tended to destroy the efficiency of the traps after about three days.

Changes in the lure were made during the season, according to official recommendations. When it was noted that the bait material was apparently "burning out" too soon, the pre-fermentation period was shortened to 24 hours as long as daytime peak temperatures were above 77 degrees F. Pyridine in purified form has been added to the standard fermenting lure at the rate of 0.1 percent of the final mix. In re-evaluating methods used to fill and wash the McPhail traps, project personnel designed the "Soup-kup" nozzle, a device for filling the trap to the proper level without allowing the bait material to contaminate the outside of the trap. Approximately 10 percent of the traps, scattered in strategic locations, have been baited with a 1 percent Staley's Insecticide Bait No. 1 in water on the basis that seasonally this lure has proven several times as effective as the standard.

Breakage of the glass McPhail traps through vandalism and hard usage was very heavy this year. An accurate count made from the first of June to the end of the year recorded 350 broken traps.

As part of the survey within the eradication areas, all drop or over-ripe fruit was inspected for larvae, fumigated using methyl bromide, and destroyed. In other areas fruit was inspected on a random detection basis. Special stress was placed on close inspection of fruit this year due to the large numbers of adult flies in the area, and the presumably increased possibility of infestation. During the season, 3,657 pounds of host fruit from 302 properties were inspected, requiring 73 man-hours, and 1,910 cc. of methyl bromide.

Samples of native and ornamental fruits were gathered and submitted to the United States Department of Agriculture laboratory in Mexico City for bioassay. Of these, nearly all were reported to be acceptable to the Mexican fruit fly for oviposition purposes,

and although eggs hatched, in no case were the larvae recorded as able to complete their development.

Eight Mexican fruit fly adults were trapped on the California side of the border during July. Six flies were found on residential properties in the City of San Ysidro. Two of these finds represented repeat locations from past years, and two were trapped in canyon terrain to the east. Of the eight flies taken in California this season, three were trapped in toyon, two in pomegranate, and one each in grapefruit, fig and mulberry. Soil was sifted under host trees on properties where positive finds were made to determine the possible presence of puparia. No puparia of Mexican fruit fly were recorded. The soil sifting survey activity required 121 man-hours, assisted by personnel of San Diego County Agricultural Commissioner.

In order to keep property owners aware of current conditions, the project office and the San Diego County Agricultural Commissioner's Office placed news releases in the local papers, produced and handed out information leaflets, and made personal contacts as needed.

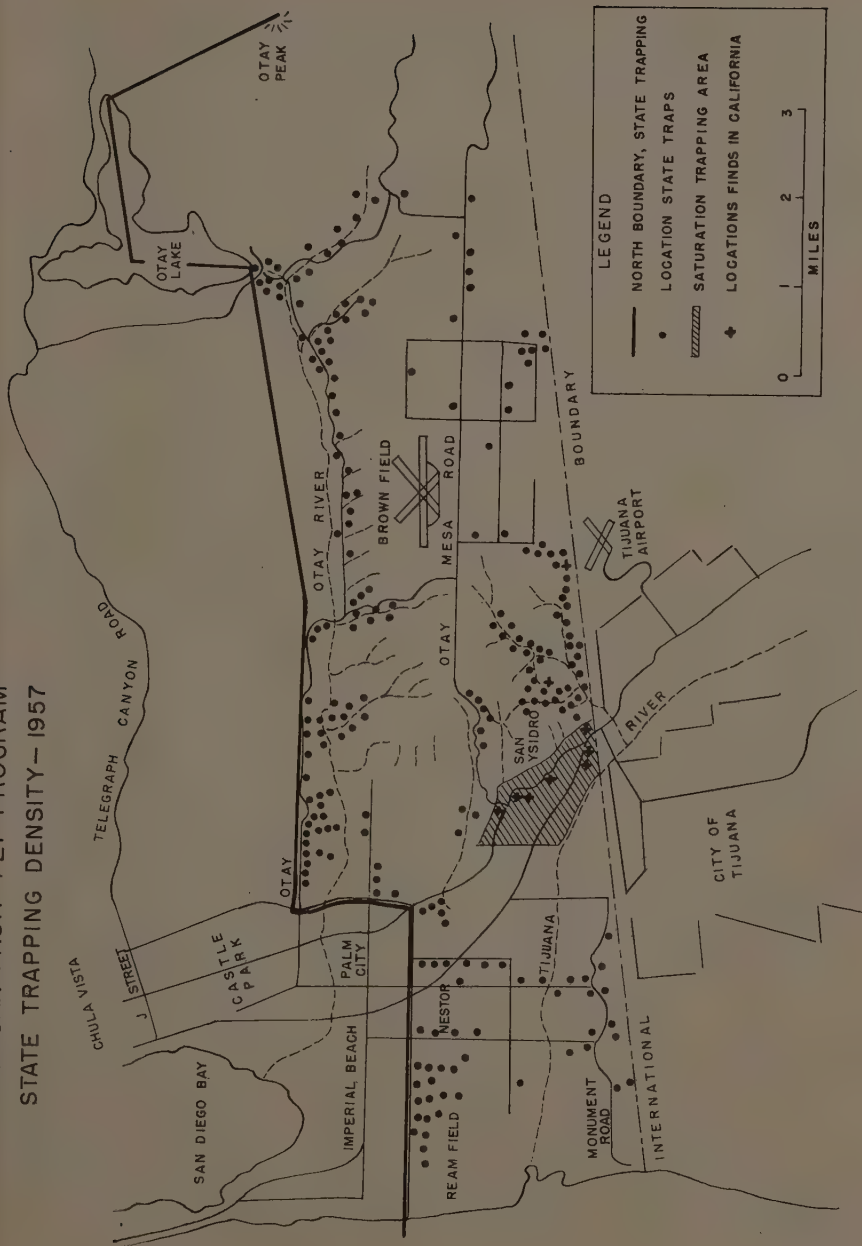
Federal Participation

In carrying out their assignments in California, the U. S. Department of Agriculture maintained trapping and fruit inspection surveys in San Diego County, backing up the quarantine and treatment zone. In the Imperial Valley area additional survey was carried on during the winter months. During the year 81,221 trap servings were made in California by federal inspectors, requiring 4,269 property visits, and 7,265 man-hours. Larval inspections were made on 1,386 properties.

Spray materials used to carry out the state treatment program were supplied by the U. S. Department of Agriculture.

The U. S. Department of Agriculture program in Baja California was continued as in past years with intensive survey in the northwestern area, and treatments encompassing positive finds. Spray treatments at Tecate and Tijuana were continued throughout the entire year. Treatments at Ensenada and the Mesa district south of Tijuana proper were re-established subsequent to trapping adult flies there this year.

MEXICAN FRUIT FLY PROGRAM STATE TRAPPING DENSITY—1957



MEXICAN FRUIT FLY TRAP DENSITY—SAN DIEGO PROJECT AREA

An aggregate total of 404,869 hosts and associated nonhosts were treated, requiring 54,598 property visits.

Survey activities in Baja California continued on schedule through the season. A

record number of Mexican fruit fly adults was trapped south of the border during 1957. Ten were taken in June at Tijuana, 89 in July at Tijuana, two in July at Ensenada, and five in August at Tijuana.

CONTROL OF MIGRATORY INSECT SPECIES

Certain important insect pests, because of their migratory habits, are not amenable to ordinary grower-applied control practices. The sources of infestation in these cases are uncultivated lands some distance from the high-value crops subsequently attacked, and often involve property owners who have no direct interest in the problem. Because of these factors, which complicate normal crop protection procedures, official services and assistance are provided in instances of community grasshopper control programs, and in the regular application of sugar beet leafhopper control measures.

Beet Leafhopper, *Circulifer tenellus*—Harold J. Green

The beet leafhopper, *Circulifer tenellus*, is a migratory insect that breeds on weed hosts in rangeland along the west side of the San Joaquin Valley and elsewhere, migrating to cultivated crops in the spring. It carries a virus disease which transmitted to susceptible plants such as beets, tomatoes, melons, flax, beans and several ornamental plants, causes "curly-top." The estimated value of crops in the San Joaquin, Salinas, Sacramento and Imperial Valleys affected by the beet leafhopper exceeds \$135,000,000.

Control Programs

Official control work for this insect is basically confined to native breeding grounds which extend from the Altamont Pass in Alameda County to Wheeler Ridge in Kern County. Because plant relationships serve to concentrate beet leafhopper populations at four particular intervals, correlated spray campaigns are timed so as to destroy the maximum numbers. The four different campaigns are the early fall Russian thistle spraying (October), the late fall perennial spraying (November), winter spraying of annuals (January and February), and spring spraying of annuals (April and May).

Spray materials consisting of one pound DDT to each gallon of diesel oil are generally applied at the rate of one gallon per acre.

Intermittent rains during January germinated winter annuals throughout the breeding grounds, but vegetative growth was not such as to concentrate beet leafhoppers until the middle of February. The largest acreage of such favorable growth with the heaviest concentrations of leafhopper was found in the Coalinga area.

Spraying of overwintering populations on winter annuals started February 18th, and concluded February 23d, a total of 6,025 acres being covered. Except for 450 acres sprayed in Merced County, all of the winter spraying was done by helicopter. Subsequent checks showed from 98 to 99 percent kill for both campaigns. By the end of March, fairly heavy nymphal populations were found throughout the breeding grounds, and spring spraying started April 1st, and concluded April 17th. Rainfall the first part of May revived the winter annuals causing a second generation of beet leafhoppers in some areas. This condition made it necessary to do some spot spraying during the latter part of May. A total of 8,475 acres was treated by Buffalo turbine during the spring campaign. By the middle of April there was an initial movement of beet leafhoppers into the valley.

Tomatoes, highly susceptible to the virus transmitted by the beet leafhopper, are used as a yardstick to measure the amount of damage done by this insect. Surveys were made of tomato fields in various counties during the growing season. Several fields were checked in each county, and an average of less than 1 percent "curly-top" damage was found. Counties checked included Tulare, Fresno, Madera, Merced, Ventura, Santa Barbara, San Luis Obispo, Monterey, San Benito, Santa Clara, Alameda, Stanislaus, San Joaquin, Yolo, Sacramento, and Colusa. Beet fields examined in these various counties showed very little "curly-top."

However, in south Kern County, a few fields were found during late summer showing 30 to 40 percent "curly-top" damage. In checking these fields, it was found they were heavily infected with virus yellows,

which no doubt broke down their resistance to the "curly-top" virus. In addition, they were planted adjacent to breeding ground areas where late spring rains may have resulted in a second generation of leafhoppers.

Late rains in May germinated an abundance of Russian thistle from the Big Panoche Canyon area south through Wheeler Ridge. The first mapping of these infestations in June showed approximately 250,000 acres subject to fall spraying. Due to the drying of thistle in some areas, the second mapping in September showed approximately 200,000 acres to be sprayed. To assure accurate mapping, and to obtain a more graphic picture of the areas, this work was done by helicopter. During August, contracts were awarded for aerial spraying of Russian thistle infestations, and the furnishing of insecticide for the operation. Aerial spraying started October 2d, and concluded October 18th, a total of approximately 194,150 acres being covered.

Prespray population counts on Russian thistle averaged 10 to 62 per sweep for a series of 20 sweeps in different areas with some individual counts of 180 per sweep. Kill checks were made in all areas within 24 hours, 48 hours, and seven days. The 48-hour and seven-day check showed on approximately 99 percent kill.

Buffalo turbine sprayers operated by State personnel sprayed small patches of thistle that did not lend themselves to aerial spraying. A total of 5,225 acres was treated by this means for a total of 199,375 acres of Russian thistle sprayed for the protection of the 1958 crops.

Russian thistle and other summer hosts had dried in most areas by the latter part of October, and beet leafhoppers were moving on to brushy perennials.

The regular fall spraying started in creek bottoms and canyons adjacent to Tracy on October 24th, and concluded November 8th

in Kern County. Population counts ran from 2 to 10 per sweep on the perennials for a series of 10 sweeps with some high counts of 20 per sweep. During this campaign, 7,892 acres of perennial growth were sprayed. In a new approach to this spray campaign perennials in the canyons adjacent to Coalinga were sprayed by airplane during the Russian thistle spray campaign. In checking these canyons, it was found that the residual effect of the DDT worked very well, lasting until populations moved from thistle areas.

During the year a total of 223,967 acres was sprayed as shown in Table 2.

At the conclusion of the regular fall spraying, light populations of beet leafhoppers were fairly well scattered throughout the breeding grounds. However, rainfall has been sufficient to permit winter annual development such that leafhopper concentrations on the south slopes lending themselves to winter treatment should follow by January, 1958.

Russian Thistle Elimination

As Russian thistle is the primary summer host plant of the beet leafhopper crews are assigned annually to destroy small patches and scattered plants in the rangeland to prevent more widespread infestations. Basically this work is accomplished both by hoeing and spraying.

This year Russian thistle elimination work started on May 13th, and concluded on September 13th. Table No. 3 depicts the work accomplished in each county.

Most of the spraying was done with spray material formulated with diesel oil, Sinox General, Triton X-100 Emulsified, and water applied at the rate of 10 to 35 gallons per acre.

Outside of the basic project area, additional control and survey activities in the past few years have become a regular part of overall operations.

TABLE 2
Beet Leafhopper Spray Programs—1957

County	Winter	Spring	Summer	Russian thistle	Perennials	Totals
Fresno	5,575	1,845	—	52,190	2,469	62,079
Imperial	—	—	2,200	—	—	2,200
Kings	—	—	—	33,500	415	33,915
Kern	—	5,330	—	107,780	3,908	117,018
Merced	450	270	—	—	100	820
San Benito	—	—	—	325	—	325
San Joaquin	—	930	—	—	850	1,780
Stanislaus	—	100	—	—	150	250
San Luis Obispo	—	—	—	5,580	—	5,580
Totals	6,025	8,475	2,200	199,375	7,892	223,967

TABLE 3
Russian Thistle Elimination Program—1957

County	Acres hoed	Acres 100%	Acres sprayed	Miles Road	Miles Ditch	Man-hours worked
Alameda	155	11	—	66	—	174
San Joaquin	5,416	244	156	648.9	10	3,763
Fresno	5,914	279	333	1,514	1	4,584
Stanislaus	2,510	77	—	317	55	1,136
Kern	1,975	55	168	210	3	2,000
Merced	13,619	217	30	438	16	3,785
Totals	*29,589	883	687	3,193.9	85	15,442

* This large acreage represents the hoeing of scattered plants over large areas.

Desert Area Program

The spray program initiated during August of 1956 in the Imperial Valley following major "curly-top" losses, proved to be highly successful. Following this spray campaign, beet leafhopper populations remained very low throughout the valley, with practically no "curly-top" damage in cultivated crops recorded during the 1957 season. However, by June, 1957, there was a noticeable buildup in southwest areas. By July, the population was heavy enough to warrant the spraying of host plants along roadsides and ditch banks in certain sections.

Spraying started August 8th, and concluded on August 16th. Practically all of the weed hosts on the roadsides, ditch banks, wastelands, and stubble fields in cultivated lands from the Mexican border on the south to Niland on the north were sprayed. Host plants were numerous enough in the area south of Highway 80 to justify complete coverage between the desert on the west and the Alamo River on the east. It was necessary to cover approximately 75 percent of the various areas in the rest of the valley. A beet-free period was maintained during the month of August, and the farmers, irrigation district officials, highway maintenance crews and others co-operated fully in cleaning up their weeds.

This condition concentrated beet leafhoppers on the remaining weed hosts, making it possible to complete the job with two spray rigs in approximately one-half the time required with four rigs last season, and

using approximately one-sixth of the spray material. During the campaign there was a total of 1,675 miles of roadsides, 69 miles of ditch banks, 404 acres of wasteland and stubble fields covered, using 2,200 gallons of spray material. Pre-treatment counts averaged from three to 25 beet leafhoppers per sweep for a series of 10 sweeps, with high counts of 50 per sweep. Subsequent to spray application, population checks showed a 99 percent kill. The Imperial County Department of Agriculture co-operated materially in this program.

Surveys made during September and October showed beet leafhopper populations in the Imperial Valley to average one per 100 sweeps in the beetfields. By November, populations had built up to an average of three per 100 sweeps. October rains germinated desert host weeds adjacent to cultivated plantings and leafhoppers there pose an unknown threat. Further survey will be necessary to fully evaluate the problem, and to conclude as to the outlook for the coming crop season.

Technical studies pertinent to project operations were continued. Lots of 50 to 100 beet leafhoppers were collected from seven different locations in April. These were placed on nonresistant beets (one leafhopper to a beet) to check for the percentage carrying "curly-top" virus. The percentage of natural infection in each area was: Big Panoche, 6 percent; Coalinga, 4 percent; Maricopa, 5 percent; Junction Pump Station, 0; Derby Acres, 2 percent; Edison Hills, 0; and Corral Hollow, 3 percent.

GRASSHOPPER CONTROL

MARTIN M. POYNER

Grasshopper outbreak expectations for the 1957 season, based on adult surveys made in co-operation with county agricultural commissioners and the U. S. Department of

Agriculture during the fall of 1956, indicated that approximately 1,137,000 acres, primarily rangeland, would support infestation ranging from "threatening" to "severe."



Damage to young citrus planting caused by feeding of the devastating grasshopper along the west side of the San Joaquin Valley

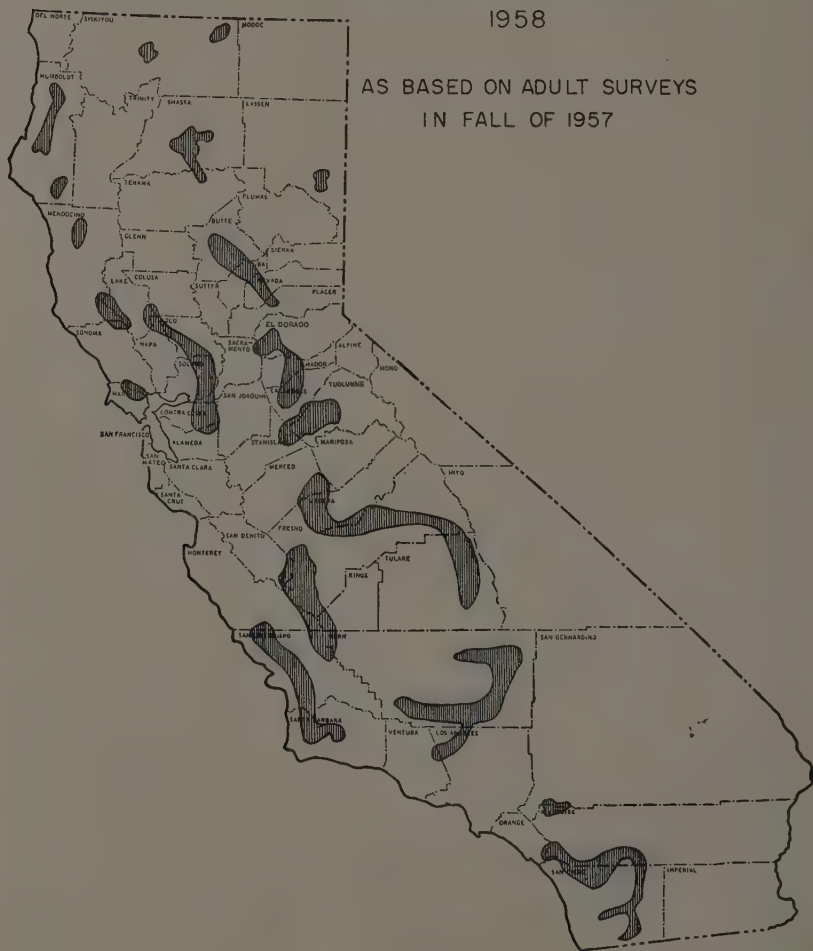
This forecast represented one of the most extensive infestation outlooks of recent years. Predictions proved highly accurate, as evidenced by grasshopper outbreaks on a statewide scale unequalled since 1949. Unusually favorable conditions for egg deposi-

tion prevailed during the late fall, particularly in the Sacramento Valley and along the foothills of adjoining mountain areas, accentuating the problem. This development was particularly significant in areas where *Melanoplus devastator* was of economic im-

POTENTIAL GRASSHOPPER OUTBREAK AREAS

1958

AS BASED ON ADULT SURVEYS
IN FALL OF 1957



portance. Favorable spring weather during the hatching period allowed for maximum nymphal survival throughout the State. Due to this combination of circumstances, grasshopper populations in all areas reached or exceeded expectations.

There were no major changes in the distribution of grasshopper species in California during 1957. The devastating grasshopper, *Melanoplus devastator*, was again the

dominant species along the west slopes of the Sierra Nevada, and predominated over north coastal and inland areas, the ebb and flow of population intensities resulting in a situation closely correlated with adult survey data collected the previous fall.

The valley grasshopper, *Oedaleonatus enigma*, was of spotted severity along the Sierra Nevada and coast range foothills. It was of particular concern in the Panoche,

Devil's Den, Keck's Corner, Coalinga and Arvin-Wheeler Ridge areas. These populations migrated towards cultivated crops, primarily cotton, barley and seed alfalfa, threatening serious plant injury or total destruction in some instances. Considerable control work was undertaken to prevent this damage from happening.

At higher elevations, in mountain meadows and over open rangeland from San Diego northward to Siskiyou, the clearwing grasshopper, *Camnula pellucida*, again appeared. Other species of importance in some areas included: *Melanoplus marginatus*, *M. femurrubrum*, *M. differentialis*, *M. mexicanus*, *Stictippus* (*Hippiscus*) *californicus*, and *Trimerotropis* sp.

Mormon crickets, *Anabrus simplex*, were of no importance in 1957, although some ranchers report that they saw single specimens. A check survey was made along the California-Nevada border areas, but no infestations were found.

During the control season of 1957, approximately 570,539 acres were treated on a voluntary basis in 40 counties. On a co-operative rangeland control basis with the Federal Government, an additional 167,839 acres were treated to prevent grasshopper damage. Co-operative rangeland grasshopper control work and the number of acres treated in each county are as follows: Alpine, 2,592 acres; Kern, 134,769 acres; San Diego, 29,374 acres; and Siskiyou, 1,104 acres. Overall treatments gave protection to 1,665,793 acres and resulted in an estimated crop savings of \$43,538,357.

During the 1957 control program, 42,359 pounds of aldrin, 5,666 pounds chlordane, 3,385 pounds dieldrin, 268 pounds endrin, 12,869 pounds heptachlor, 18,973 pounds toxaphene and approximately 2,000 pounds of miscellaneous insecticides were used throughout the State for grasshopper control.

Most of these materials were applied in the form of dry-bran bait or sprays, using either water or fuel oil as the carrier. A small amount of dusting with various insecticides was done. Generally speaking, results were rated satisfactory to excellent although two failures were reported.

In the fall of 1957 state and federal personnel held seven workshops over the state for the purpose of training county personnel in the procedures and methods of making fall grasshopper surveys. Seventy-six representatives from 31 county agricultural commissioners' offices attended these workshops. This training led to a more thorough adult grasshopper survey in 1957. The survey indicated that over 3,000,000 acres of grassland in 36 counties will carry grasshopper infestations of potential economic significance for 1958, and that an estimated 1,000,000 acres of control activity might be required to confine outbreaks.

Of greatest potential for 1958 outbreak conditions are areas in the following counties: Alameda, Amador, Butte, Contra Costa, El Dorado, Fresno, Humboldt, Kern, Kings, Madera, Marin, Merced, Nevada, Riverside, San Diego, San Luis Obispo, Santa Barbara, Shasta, Solano, Tulare, Tuolumne, Yolo and Yuba.

COMMODITY AND NURSERY STOCK TREATMENTS

EARLE T. GAMMON

During the year revision in official treatments for the exterior quarantine against cherry fruit flies, *Rhagoletis cingulata* and *R. fausta*, was suggested, with recommendations subsequently adopted by the Bureau of Plant Quarantine. Upon the discovery that young pupae of these insects are particularly difficult to kill, required fumigation dosages were increased from one-half to one pound of ethylene dibromide per 1,000 cubic feet for two hours at 70° F.

This difficulty in achieving 100 percent mortality with young pupae was encountered on another occasion, young pupae of the walnut husk fly, *Rhagoletis completa*,

also evidencing more resistance to methyl bromide fumigation than were older pupae.

The bureau recommended fumigation schedules utilizing both methyl bromide and HCN for the disinfection of various cotton products, implements and equipment to prevent the introduction of the Mexican cotton boll weevil, *Anthonomus grandis*. Treatments were also recommended, utilizing live steam and HCN fumigation to disinfest railway cars contaminated with hosts of the boll weevil. At present there is some demand for movement of such commodities from areas not covered by the federal pink bollworm quarantine.

Officially approved fumigation chambers were inspected during the year by bureau and county personnel. These rechecks serve to maintain the rooms in proper operating condition, and to keep fumigating personnel up to date on latest procedures.

Certificates of approval for eight fumigation chambers in the State were revoked for various reasons ranging from discontinuance of business to failure to maintain the proper conditions required of an officially approved chamber. One fumigation room was rebuilt by industry and approved for the use of both cyanide and methyl bromide disinfestation of nursery stock and other commodities in accordance with quarantine requirements. Such treatments must be given in a room officially approved by

this bureau. Officially approved chambers in the State at the end of the year totaled 56.

A quick and practical method was devised to measure the tightness of a fumigation room, using thermal conductivity instruments to measure gas concentrations. In checking a room, a period of 15 minutes following gas introduction should be allowed to satisfy gas sorption losses averaging 10 percent before taking an official reading with the measuring unit. A satisfactory degree of tightness is assured if the concentration loss does not exceed 3 percent in the first hour following the delayed reading. A loss over a two-hour period approaching 10 percent would call for rejection unless major leaks can be found, corrected and rechecked by test.

CO-OPERATIVE ECONOMIC INSECT REPORT

ALAN G. FORBES

One of the relatively new functions of the bureau involves participation in the U. S. Department of Agriculture, Plant Pest Control Division, Co-operative Economic Insect Report. Serving as a clearinghouse for information on the occurrence and abundance of insect pests, as received from federal, state, county, university and industry collaborators, a digest of important data is prepared and distributed on a regular basis.

Two types of reports are customarily written. The first is a weekly compilation sent directly to the Plant Pest Control Division, Washington, D. C., for inclusion in the national weekly publication. The second, a monthly release directed primarily to California readers, contains additional pest control information not included in the weekly summary, as well as a resume of regulatory programs administered by the bureau, together with insect surveys conducted by statewide co-operators. It is of interest to note that although written for use in a more restricted geographic region, this publication is sent to 12 other states, the Territory of

Hawaii, Canada and Israel, as well as governmental, scholastic and industrial circles within the State. Stemming from these reports are two others which are released annually, a yearly summary of crop insect pests published in the national organ, and a list of the 10 most important insect-mite species attacking agricultural crops in the State.

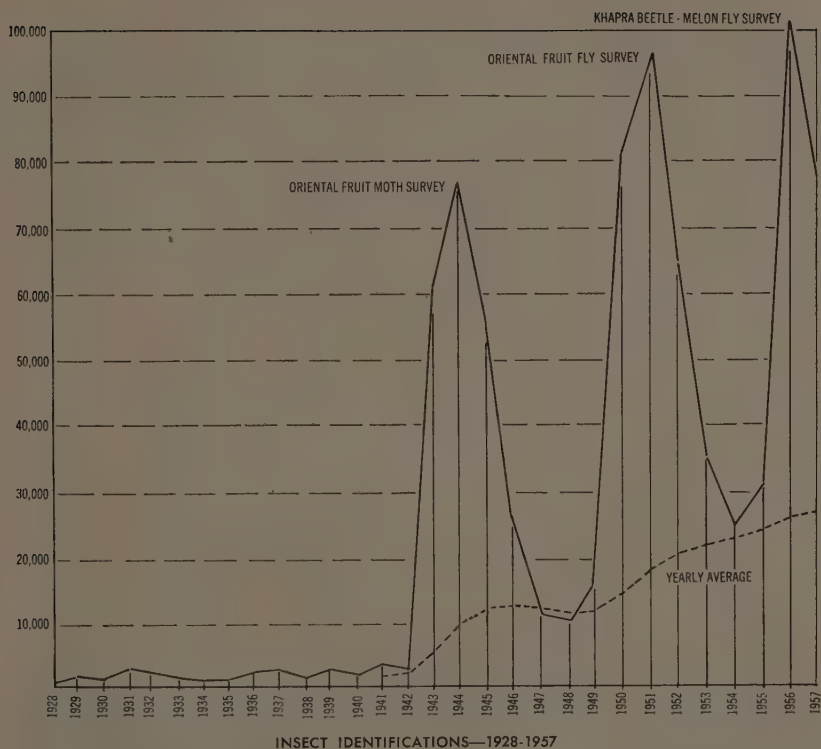
The objectives of this survey reporting function is eight-fold in nature: (1) to assist farmers and agricultural workers to protect crops by supplying current information on insect activity; (2) to aid manufacturers and suppliers of insecticides and equipment to determine where supplies are needed; (3) to aid and assure prompt detection of newly introduced insects; (4) to develop a workable insect pest forecasting service; (5) to develop nationwide uniformity in reporting insect conditions; (6) to determine losses by insects; (7) to maintain records on occurrence of domestic and foreign economic insects; and (8) to provide a nationwide organization for biological warfare defense as it relates to insects.

SYSTEMATIC ENTOMOLOGY

H. H. KEIFER

Insect identifications serve to keep state, county and federal workers accurately informed as to the insects they encounter, and to govern the level of official action resulting from quarantine, nursery and field collections. The significance of the accuracy

of this work is readily apparent. A positive identification of an important pest may lead to expensive abatement operations, result in an embargo on host shipments, or otherwise call for action resulting in considerable losses or expenditures to all concerned.



The insect identification laboratory made 79,071 species determinations during 1957. While this total is 22,429 below the number made last year, it should be noted that 1956 was the highest year to date from the standpoint of identification work.

The continual increase in workload is due to outbreaks of important insects in California and to an increase in state, county and federal survey activities. The first identification peak came in 1944, and was the direct result of the discovery of Oriental fruit moth in California late in 1942. The second peak in 1951 was the result of surveys for the Oriental fruit fly and the cherry fruit fly. The latest peak in 1956 was due mainly to combined surveys for melon fly, walnut husk fly, Mediterranean fruit fly and Khapra beetle. The 1957 survey accounting for the largest number of identifications was

the multiple-purpose fruit fly survey with the walnut husk fly survey not far behind.

The problem of identifying insect and mite species varies a great deal according to the kind and size of the species. Some because of size, color, and frequency of arrival, are easily named. Others have more hidden characteristics which must be made visible by dissection, clearing, staining, and magnification.

The simplest determinations require but one work unit of operation, a quick examination without preparatory work, the most difficult entailing dissection and mounting, takes 15 such work units of operation.

On the basis of this gradation the Khapra beetle identifications made the greatest impact on the office, being somewhat more time-consuming than all of the fruit fly survey identifications combined.

During 1957, 166 plastic blocks were distributed by the laboratory. These blocks contained examples of such insects as Mexican fruit fly, Mediterranean fruit fly, and melon fly.

The bureau supplies county offices, border quarantine stations, and federal survey entomologists with identification slips, mailing tubes, and vials. Twenty-seven thousand one hundred ten (27,110) vials and 4,619 tubes were dispensed during 1957.

Enrollment in the state-led correspondence course in entomology totaled 30 during

1957, with three new enrollees and two-course completions recorded. More than 50 sets of the course were distributed to other agencies. An extension course given by San Diego State College, offering two units of credit, is using the syllabus, while an adult education course at El Centro with 21 federal, state and county participants, is also based on this publication. A good example of county use of the material comes from Los Angeles County, where, under a county-led program, 15 students successfully completed the course.

TABLE 4
Identification Totals for 1957

	County	State	USDA	Misc.	Totals	Work unit value
General	4,637	—	—	—	4,637	(12) 55,644
Quarantine						
Interstate	345	—	—	—	345	(6) 2,070
Intercounty	51	—	—	—	51	(6) 306
Border		5,045	—	—	5,045	(3) 15,135
Surveys						
General	—	868	65	—	933	(12) 11,196
Khapra beetle	1,308	3,316	4,008	—	8,632	(15) 129,480
Beet leafhopper	—	464	—	—	464	(6) 2,784
Pink bollworm	—	238	222	—	460	(6) 2,760
Cherry fruit fly	459	6,731	—	—	7,190	(1) 7,190
Mediterranean fruit fly	3	1,798	—	—	1,801	(1) 1,801
Melon fly	6	25,050	13	—	25,069	(1) 25,069
Mexican fruit fly	216	151	188	—	555	(1) 555
Walnut husk fly	18,485	3,745	—	—	22,230	(1) 22,230
Wheat sawfly	—	109	—	—	109	(6) 654
Grasshopper	—	—	27	—	27	(6) 166
Nursery service	—	63	—	—	63	(12) 756
Miscellaneous	—	—	—	310	310	(6) 1,860
Walnut growers	—	—	—	1,130	1,130	(6) 6,780
U. C.	—	—	—	20	20	(6) 120
Totals	25,510	47,578	4,523	1,460	79,071	286,556

APIARY INSPECTION

ELBERT R. JAYCOX

Despite the fact that fewer colonies of bees were inspected in California in 1957 than in 1956, the disease rate was somewhat higher. Limited inspections tend to reveal more disease because of concentration on problem areas, and on operators who have difficulty in controlling American foulbrood in their bees. Inspections were done by 35 permanent county apiary inspectors, two part-time inspectors and a deputy state bee inspector.

One of the most serious disease problems encountered in many years was found dur-

ing 1957 in an isolated, neglected apiary. The owner had been unable to care for the bees because of illness, and his entire beekeeping outfit was found to be infected with American foulbrood. Over nine hundred diseased colonies were destroyed.

Colony Numbers

California beekeepers continued their optimistic outlook in 1957, increasing their colony numbers to 559,000, according to the estimates of the California Crop and Livestock Reporting Service. This is a new

high for numbers of colonies, an increase of over 7 percent since 1952. The statistics on beekeeping in the United States during the last five years show that the numbers of colonies of bees have remained stable or declined in most states. Only six states, including California, Florida, Arizona, Nebraska, North and South Dakota, have shown consistent increases in numbers of colonies. Increases range from over 7 percent for California to more than 89 percent in South Dakota.

Honey Crop

California's 1957 honey crop was estimated at 22,360,000 pounds, 23 percent below the previous year and 32 percent below average. Yields were down in nearly every area of the State, especially from the citrus and alfalfa nectar flows. In spite of the lower yields, California was the top honey-producing state, followed closely by Minnesota and Florida.

Many beekeepers began producing royal jelly for commercial use during 1957. Some produced the material as a side line to their other beekeeping activities, and others devoted all their time to it. In response to

requests by beekeepers, the Federal-state Market News Service began to carry price quotations on royal jelly during December.

Disease Diagnosis

Adult and brood disease diagnoses decreased in 1957. Two hundred two samples were examined. Of these, American foulbrood was present in 113, including one infected queen cell. European foulbrood was positive in 20 samples and two samples were either European or parafoolbrood. Four lots of adult bees contained spores of *Nosema apis*, a protozoan parasite. The other 63 samples contained no known bacterial or protozoan infection. One smear from Lakeside, San Deigo County, and one from Imperial Valley, contained bacteria differing from those commonly found in bee disease smears. They could not be identified by U. S. Department of Agriculture bacteriologists because of lack of sufficient material.

Pesticide Losses

The losses of bees from pesticide applications were lower in 1957 than in 1956 based on field observations and samples of honeybees submitted to the Bureau of



Inspection of diseased comb in wax salvage plant licensed in 1957 at Fresno, California

Chemistry for analysis. Largest number of samples came from locations near alfalfa, followed by citrus and prunes. Parathion was the material most frequently suspected and confirmed as the cause of honeybee losses. Four apiaries were damaged by an application of parathion to a large prune orchard just prior to, and during, the early bloom. Colonies foraging on mustard in bloom in alfalfa fields were damaged by insecticide applied to the alfalfa. Others were reported damaged by grasshopper control with dieldrin and chlordane near seed alfalfa.

Other Losses

Each year some of the losses attributed to pesticides are actually losses from poor management. An investigation in 1957 of a report of a heavy loss of field bees following an early morning application of a DDT-toxaphene spray on seed alfalfa lent proof to this conclusion. The bees had been on an orange location, where they attained a high colony population, but did not allow the queen to maintain an adequate brood nest. When the colonies were moved to the alfalfa location, they lost their old field bees at about the time the insecticide was applied. Other colonies, at the same location, which had not been on an orange flow, were entirely normal after the insecticide application.

An apiary of 75 colonies of bees near Lake Hodges in San Diego County suffered losses of adult bees in early March from nectar and pollen of chaparral death camas (*Zygadenus Fremontii*). The strongest colonies lost the most bees, with as much as a quart of dead workers being found in front of the hive.

Brand and Identification Numbers

Apiary brand numbers were registered to 146 beekeepers in 1957. Identification numbers were assigned to 76 beekeepers. The use of one of these numbers is required of every beekeeper who moves his bees or who does not keep them at his residence. Questionnaire postcards were sent to all owners of identification numbers. The replies will be used to compile a new list of owners for

use by county agricultural commissioners, pest control operators, and other interested agencies.

Theft Losses

Reported thefts of bee equipment in 1957 were higher than for many years. Nine lots of equipment totaling 350 colonies were stolen, and none recovered.

Legislation

One section of the bee disease article of the Agricultural Code was amended during the 1957 Session of the Legislature. Section 275.5, as amended, no longer requires certificates of inspection on queen bees shipped within the State. Certificates are still required for queens entering the State, and for all package bees. Two other proposals for changes in the code, to liberalize inspection procedures, and provide reimbursement for colonies destroyed for disease, were referred to the Joint Interim Committee on Agriculture and Livestock Problems for study.

Wax-salvage Plants

Three licensed wax-salvage plants operated during the inspection season, salvaging wax from combs infected with American foulbrood. In November, a new plant at Fresno was licensed, and began operation. The other salvage plants are in Colton, San Bernardino County; Yorba Linda, Orange County; and Colusa, Colusa County.

General Information Service

The bureau has 21 motion picture films, including four short versions suitable for television purposes, depicting major insect pest species subject to special attention by the department. During 1957 these films were shown on 62 occasions to an audience totaling 3,637 and representing county, state and federal agricultural officials, grower, industry and student groups.

Mimeograph releases covering many regulatory entomology subjects totaled 69 as follows: "A" series, Apiary 13; "E" series, General Entomology and Pest Control, 12; "S" series, Survey 6; and miscellaneous progress reports and administrative releases, 38.

TABLE 5
Record of Inspection

County	Apiaries			Registered	Colonies	
	Registered	Inspected	Diseased		Inspected	Diseased
Alameda	157	24	13	3,049	308	46
Alpine	—	—	—	—	—	—
Amador	8	—	—	226	—	—
Butte	153	211	34	16,818	5,144	75
Calaveras	25	—	—	454	—	—
Colusa	159	79	26	12,532	4,463	90
Contra Costa	15	51	16	886	1,876	24
Del Norte	5	—	—	43	—	—
El Dorado	5	—	—	358	—	—
Fresno	237	87	24	35,025	5,007	176
Glenn	243	60	10	8,350	2,128	30
Humboldt	31	11	4	138	46	13
Imperial	1,083	394	63	29,422	17,147	111
Inyo	—	—	—	—	—	—
Kern	442	313	92	39,836	13,530	415
Kings	223	19	15	18,042	909	43
Lake	—	41	2	—	197	2
Lassen	39	21	1	401	195	2
Los Angeles	696	563	133	33,231	11,957	444
Madera	62	170	23	4,753	3,064	37
Marin	10	1	—	63	—	—
Mariposa	—	—	—	—	—	—
Mendocino	51	7	—	240	62	—
Merced	206	120	73	29,109	5,220	281
Modoc	2	7	3	877	239	48
Mono	—	—	—	—	—	—
Monterey	3	11	2	61	545	4
Napa	62	—	—	5,002	—	—
Nevada	4	—	—	60	—	—
Orange	161	191	28	5,514	4,544	89
Placer	12	39	23	516	1,889	98
Plumas	10	1	—	548	17	—
Riverside	530	135	55	22,673	6,297	224
Sacramento	92	20	2	3,236	413	6
San Benito	—	—	—	—	—	—
San Bernardino	480	510	84	12,735	19,782	205
San Diego	712	151	41	28,023	7,843	129
San Francisco	2	1	—	5	1	—
San Joaquin	70	—	—	4,181	3,411	98
San Luis Obispo	125	9	8	5,652	249	59
San Mateo	95	91	10	970	963	21
Santa Barbara	111	95	1	3,819	2,331	6
Santa Clara	53	121	22	1,424	1,010	93
Santa Cruz	5	35	6	282	1,529	7
Shasta	220	90	30	7,090	6,411	102
Sierra	—	—	—	—	—	—
Siskiyou	5	18	11	742	23	11
Solano	286	169	33	6,477	3,998	94
Sonoma	154	115	40	6,370	2,497	111
Stanislaus	94	61	19	8,036	2,651	34
Sutter	289	114	62	13,960	7,327	183
Tehama	193	174	25	8,725	8,000	75
Trinity	—	—	—	—	—	—
Tulare	79	62	12	7,530	1,061	68
Tuolumne	28	15	—	260	89	—
Ventura	261	148	45	17,618	10,061	1,288
Yolo	182	80	8	8,808	1,855	30
Yuba	40	56	18	3,566	2,697	67
Totals	8,210	4,691	1,117	417,736	168,986	4,939

Percent apiaries diseased 23.8
Percent colonies diseased 2.92
Percent estimated number of colonies in the State which were registered 74.7
Percent estimated number of colonies in the State which were inspected 30.2

Bureau of Field Crops

WILLIAM L. HUNTER, *Chief* *

HARRY E. SPIRES, *Assistant Chief*

The Bureau of Field Crops administers five chapters of the Agricultural Code which provide for both service and regulatory activities. These are as follows:

1. Field Crops Inspection, Division 5, Chapter 4.
2. Commercial Feeding Stuffs, Division 5, Chapter 7a.
3. Agricultural Warehouses, Division 6, Chapter 5.
4. Public Grain Warehouse Inspection, Division 6, Chapter 5a.
5. Livestock Remedies, Division 5, Chapter 7b. (Effective January 1, 1958.)

The bureau also provides the terminal weighing service established under the Business and Professions Code, Division 5, Chapter 8. All activities are supported from special funds collected under the laws establishing the functions. Facts relating to revenues and expenditures are contained in the financial statement of the department. Offices and laboratories are maintained at Sacramento, San Francisco, Oakland, Los Angeles, Vallejo, Petaluma, and Imperial (seasonal).

Each function of the bureau is discussed separately in this report.

Field Crops Inspection

The department has adopted by regulation the uniform standards established by the Secretary of the United States Department of Agriculture for use in this work. These standards fall into two categories: those under the United States Grain Standards Act, covering all grains, flaxseed, and soybeans; and those referred to as *permissive standards*, covering rough rice, milled rice, hay, dry edible beans, peas, and hops.

Inspection and grading in accordance with these standards is performed under license and general supervision by the United States Department of Agriculture. The work on products graded under the permissive standards is subject to a formal agreement which

provides for payment to the federal agency of 15 percent of the fees collected.

In addition, the bureau determines quality factors on a number of field crops, such as safflower and castor beans, for which no official standards have been established, and it performs miscellaneous services in connection with the marketing of fungible products as defined in the Agricultural Code.

All services are performed upon request, and the applicant pays for them in accordance with a schedule of fees set forth in regulations. The fees collected must be sufficient in the aggregate, to pay the cost of the services performed.

In early days, California farmers packed their grain and other similar crops in bags at the time of harvesting. It was stored and finally marketed in the same bags without losing its identity. Modern methods have brought about bulk handling of all of the field crops. The change has increased the need for inspection services, because there must be some classification of quality before the crops can be commingled with like products in bulk storage. Federal price support programs, under which loans are made upon the product, take quality into account, and also require a grade determination for loan purposes.

An additional part of Field Crops Inspection is the certification of grain being exported to Europe and Asia. In order to guarantee that the grain conforms to contract grade, a sampler and licensed inspector continually check the grain as it is loaded aboard the vessel.

These reasons, among others, have been responsible for much of the growth of the inspection service.

The greatest amount of inspection is done at terminal and other major storage points where inspection is an established practice; present costs of operation do not permit establishment of service at country points

* Deceased, March 16, 1958.

for an economical price. There are some areas of the State where the quantity of grain grown and marketed is sufficient to support a seasonal operation, and these offer probabilities for future expansion. The bureau attempts to serve all who desire inspection, and it can often meet their needs even where they are removed from inspection points. Arrangements have been made with collaborators to sample the product and forward it to one of the laboratories for inspection and grade certification.

Table 1 shows the number of inspections performed, classified according to type of inspection.

TABLE 1

Inspection Certificates Issued

	1955	1956	1957
All grains	41,879	41,635	44,910
Combined, rice, beans, hops, and hay	19,571	20,069	16,318
Miscellaneous commodities and services, including terminal weighing	3,601	3,548	4,183
Total	65,051	65,252	65,411

Table 2 shows the growth of field crops over the past 20 years of operation.

Table 3 shows workload of each inspection office as a percentage of total inspection.

TABLE 3

**Percentage of Total Certificates Issued
by Each Inspection Office**

	1955 Percent	1956 Percent	1957 Percent
Sacramento	30.2	27.6	30.7
Stockton	22.7	26.1	30.3
San Francisco ¹	19.8	19.0	13.4
Los Angeles ²	15.6	13.0	14.4
Vallejo	6.8	8.3	6.3
Petaluma	4.9	6.0	4.9

¹ Includes terminal elevators at Oakland and Pier 90, San Francisco plus terminal weighing.

² Includes seasonal office at Imperial.

Commercial Feeding Stuffs

The volume of commercial feeding stuffs sold in California continued at a high level and exceeds that of any other state.

Collections of inspection tonnage tax on sales to consumers shows approximately 4.6 million tons, which is about the same as the preceding year. This tonnage includes not only formula feeds, but some feed ingredients sold to large feeders who do their own manufacturing. A substantial part of the total tonnage, about 1,000,000 tons, is sold in commercial feed lots for fattening cattle.

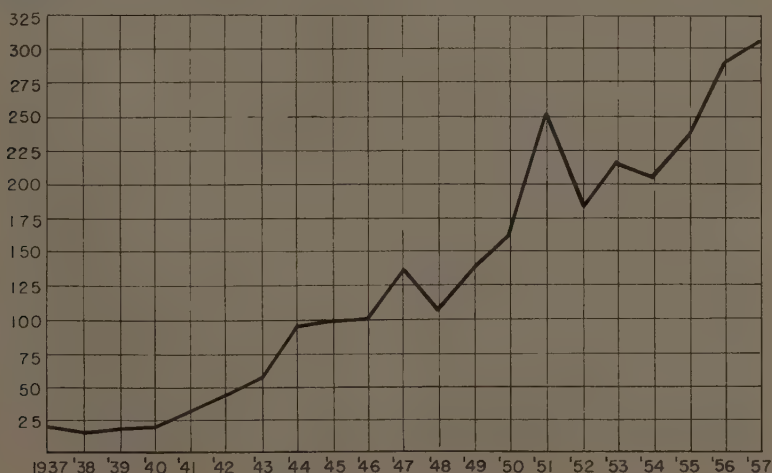
While the volume of feed sold has been rising to the present level, there has been a reduction in the number of retail outlets.

TABLE 2

GROWTH OF FIELD CROPS INSPECTION

1937-1957

(REVENUE)
THOUSANDS
OF DOLLARS



The number of stores selling feed, most of them as a sideline, has been steadily declining for the past several years. Two factors are probable explanations for this change in business.

An important one is the dislocation of poultry raising caused by encroachment of urban populations. This has necessitated relocation of operations in new areas with some accompanying feed business mortality.

The second factor is the new importance of services associated with feed sales. Field service men, employed by feed dealers, supply a substantial amount of assistance in raising poultry by providing advice to management and, sometimes skills, such as culling of flocks.

As the importance of service has grown, small diversified store operators have often decided to discontinue such business rather than meet competition in this regard. Their feed business volume could not support the cost of technically trained personnel.

Regulatory experience, in the past year, has shown some decrease in conformity of feeds to their labeled guarantees, as compared with an excellent record in 1956. Unlike other years, these findings do not seem to have been caused by supply conditions, but by economic pressures. Low prices for products of the poultry industry, prevailing during most of the year, were strongly reflected in the operations of the feed manufacturer.

Under the pressure of supplying feed at the lowest possible cost, it was necessary to take advantage of any price-nutrient

ratios favoring usage of several ingredients. As formula changes were frequently made, labels were not precisely adjusted accordingly, and failure to meet guarantees resulted. By maintaining close field follow-up of these laboratory findings, violations were held to a minimum.

Chronic or continued violations in any particular respect, as applied to single feeds were almost entirely avoided. The increased number of total violations found is, therefore, largely an accumulation of single violations. Such a circumstance, having been controlled by administrative action, does not warrant active prosecution.

The number of official samples analyzed by the feed laboratory reached a level attained in very few previous years in the history of its work. This accomplishment has been possible because the laboratory has been able to maintain its present staff to the point that they are now at a peak of efficiency. Their rising productivity has made it possible to meet new responsibilities without increasing the staff. The variety of their work, too, continues to expand, primarily in the fields of analyses for drugs and trace mineral nutrient guarantees.

Nearly all feeds for young poultry include one or more drugs for growth promotion and disease prevention, and many of those for other types of animal production are beginning to follow a similar pattern. Laboratory capacity is a very definite limitation in regulatory work on commercial feeds.

TABLE 4

Statistics indicating the major activities by the bureau in commercial feeding stuffs for 1957, as compared to previous years are shown in the following table:

	1955	1956	1957
Licenses issued as of December 31st.....	3,025	2,915	2,822
Calls made by inspectors.....	3,432	3,579	4,548
Lots of feed removed from sale by inspectors.....	24	6	10
Consisted of, in bags.....	9,275	1,365	3,395
Hearings held in regard to violations.....	3	2	—
Laboratory Activity			
Reports of inspection and general analysis.....	8,111	8,665	9,043
Vitamin assays.....	1,130	1,154	1,192
Analyses for inorganic nutrients and miscellaneous properties.....	1,263	1,681	1,876
Analyses for additives used for growth promotion or disease control.....	820	1,091	1,200
Biological evaluation tests (chick) of broiler fryer feeds.....	30	80	118
Biological evaluation tests (chick) of protein meals.....	52	25	—
Feeding trials in connection with consumer complaint studies.....	2	3	4



Rabbits and chickens are kept in the Feed Control Laboratory for biological testing of commercial feeds. Attended by Carol Laton.

Agricultural Warehouses (California Bonded)

This law provides for the licensing and bonding of agricultural warehouses upon request of the owner. The warehouse operations are then subject to inspection of the stored products and issuance of warehouse receipts.

There has been no change in the number of bonded warehouses during the past year, so enforcement of this chapter is limited to 11 warehouses with a total capacity of 65,000 tons. It is anticipated that this work will continue at approximately the current low level of activity.

Public Grain Warehouse Inspection

Warehouses regularly storing grain for the public are subject to annual registration and inspection of the stored grain to determine the extent of weevil infestation. The revenue derived limits the inspection of each warehouse to once a year. Grain found to be infested to the extent that it constitutes a hazard to other stored grain is required to be fumigated or removed.

Findings this year showed continued reduction in the tonnage of grain condemned because of excessive infestation. As was the case in 1956, the grain condemned was located in five separate counties, with 88 percent of the total being in a single county.

Greater attention has been given to the problem of preventing and controlling insect infestation of grain in the past few years. The program for control of Khapra beetle has emphasized the necessity for proper sanitation. Also, the export program has required that grain delivered to export terminals be free from infestation or be subject to fumigation by the terminal at the expense of shipper.

The following data summarizes the results of the inspection of 250 registered warehouses in 1957, with comparable figures for the previous two years:

TABLE 5

	1955	1956	1957
Tons of grain examined	260,422	238,321	143,620
Tons of grain condemned	11,652	2,736	2,580

Livestock Remedies

The 1957 Legislature enacted a law, Division 5, Chapter 7b, requiring registration of livestock remedies and the licensing of retailers of hazardous remedies. The registration includes a review of the labeling, its claims of value, guarantees of content, directions for use, and warnings against misuse. Classified as hazardous remedies, are those drugs which may be administered to humans or which may be harmful to the health of livestock, or to humans who consume products of such animals when the drug is misused.

Although the effective date of the law was January 1, 1958, considerable prelim-

inary work was performed prior to that date. Necessary forms for registration and licensing were devised and printed. Notices to manufacturers of record were forwarded, and satisfactory progress was made prior to the effective date in formulating procedures and policies. Enforcement will be in association with commercial feeding stuffs.

Terminal Weighing

Demand for this service continues very limited and restricted to one location. This service is utilized by flaxseed growers in San Mateo County for obtaining net weights of trucks of flaxseed delivered to a crushing plant in San Francisco.

Bureau of Plant Pathology

GILBERT L. STOUT, *Chief*

GEORGE E. ALTSTATT, *Assistant Chief*

Activities in the Bureau of Plant Pathology include the detection, diagnosis, suppression, eradication and prevention of the introduction and spread of infectious plant diseases. The work covers a wide variety of diseases and disease situations in a broad range of crops and kinds of plants. It is carried on under the provisions of the California Agricultural Code and is concerned primarily with Sections 15, 30, 30.5, 33, 100, 108, 108.5, 108.6, 119.5, 139, 153.5 and other related sections.

An important function of the bureau is to give technical assistance to other bureaus in the department and to the county agricultural commissioners in connection with their enforcement of those sections of the code with which they are concerned. Both field and laboratory services are supplied. Plant disease diagnostic laboratories are maintained at Sacramento and at Riverside. The num-

ber of specimens requiring laboratory attention in 1957 was 6,555, or 1,200 more than in 1956, and a greater number than in any previous year.

Angular leaf spot of cotton, also known as bacterial blight, caused by the bacterium *Xanthomonas malvacearum* (E. F. Sm.) Dowson, continued to be a problem in sprinkler irrigated cotton plantings in the San Joaquin Valley.

Bacterial canker of tomato, caused by the bacterium *Corynebacterium michiganense* (E. F. Sm.) Jensen, apparently was more prevalent than usual in some localities.

Further progress was made in suppression of the peach yellow leaf roll disease in Butte, Sutter, and Yuba Counties.

Detailed reports on activities and projects of the bureau are given by the technical personnel concerned.

NEW DISEASE DETECTION IN CO-OPERATION WITH COUNTY AGRICULTURAL COMMISSIONERS

By CARL W. NICHOLS and T. R. CARPENTER, *Associate Plant Pathologists*, and DAN Y. ROSENBERG, *Assistant Plant Pathologist*

Inspections are made by state and county personnel to detect incipient infestations of plant disease organisms not known to occur in California, or known only in certain areas. The inspections are made under the super-

vision and co-ordination of state plant pathologists. County inspectors are instructed in the symptoms and signs of these diseases.

As a part of this instruction, the bureau has been preparing illustrated articles on the



Tomato transplants with roots parasitized by Cooper's broomrape *Orobanche ludoviciana* var. *cooperi*. The young broomrape plants are in successive stages of development varying from nodules to asparaguslike shoots. (Photograph by E. C. Kennedy, Deputy Agricultural Commissioner, Riverside County, California.)

diseases. In a few instances, diseases which are more widespread have been included because of their special interest. These articles have been and are being published in the California Department of Agriculture Bulletin. During 1957 the articles published to date were assembled in handbook form and a copy was sent to each county agricultural commissioner.

Broomrape

Cooper's broomrape, *Orobanche ludoviciana* Nutt. variety *cooperi* (Gray) G. Beck., has been known as a parasite of burro-weed, *Franseria dumosa* Gray, in Southern California for many years, but until recently it was not thought to be of economic importance in California. It was found in 1956 to be parasitizing tomato, *Lycopersicon esculentum* Mill., near Mecca in Riverside County.

Intensive surveys were conducted in 1957 by Bureau of Plant Pathology, Nursery Service, and county department of agriculture personnel in the tomato fruit and

tomato transplant growing areas of Riverside and Imperial Counties to determine the incidence of the parasite. The broomrape was found to be generally distributed on wild and domestic hosts east of the Whitewater Storm Channel in the Coachella Valley of Riverside County, and north of the town of Niland on the east side of the Salton Sea in Imperial County. In addition to burro-weed and tomato, T. R. Carpenter of our bureau found it on Spanish needle, *Palafoxia linearis* Lag., and plicate coldenia, *Coldenia plicata* Cov.

Personnel of the Riverside County Agricultural Commissioner's Office found the parasite on the roots of tomato plants grown in nursery beds for transplanting.

Since many thousands of these plants had been shipped from the nurseries prior to finding the broomrape, a detection program for the parasite was started in areas where the transplants had been planted in the Sacramento, San Joaquin, and north coastal valleys. State, county and industry co-operated in these inspections. Tomato fields that had received tomato transplants from the infested nurseries were closely inspected to determine whether the parasite had been carried into them.

Inspections were made during July, August, September, October, and November of 63 properties with 3,703 acres in Alameda, Contra Costa, Fresno, Sacramento, San Joaquin, Santa Clara, Solano, Stanislaus, Sutter, and Yolo Counties. Twenty-eight of these properties with 2,291 acres received a second inspection. Nine properties with 753 acres received a third inspection, and two properties with 250 acres received a fourth inspection. No Cooper's broomrape was found. However, a single plant of Spanish needle, one of the host plants previously mentioned, and previously unreported outside of its native desert habitat, was found in a San Joaquin County tomato field which had received tomato transplants from the Mecca area.

The Bureau of Rodent and Weed Control and Seed Inspection conducted tests to determine the viability of seed collected from broomrape plants. Seed collected in the springs of 1956 and 1957 germinated on filter paper in very low percentages, both in the presence of tomato roots and alone. Those in the presence of tomato roots germinated a few days earlier than those on filter paper alone. The seed used had been collected

from broomrape plants growing on the roots of tomato and of burro-weed.

In our 1955 Annual Report, a broomrape, diagnosed at that time as *Orobancha ludoviciana* Nutt., was reported parasitizing elderberry and tomato in Alameda County (Bull. Calif. Dept. Agr. 45 (2): 174. 1956). Dr. G. T. Robbins, Herbarium Botanist, Jepson Herbarium, University of California, Berkeley, has subsequently examined this broomrape, and identified it as *O. comosa* Hook. var. *vallicola* Jepson.

A broomrape parasitizing elderberry on a San Joaquin County property was reported in 1949 by Mrs. Margaret K. Bellue of the California Department of Agriculture. She identified it only as to genus, *Orobancha*. This property was reinspected during the spring of 1957, and broomrape plants again were found on the elderberry roots. The broomrape found in 1957 was identified by Mrs. Bellue as *O. comosa* var. *vallicola*.

Inspections were made for the branched broomrape, *Orobancha ramosa* L., in the periphery of the previously known infested area in Alameda County, and in adjoining parts of Santa Clara County. Seven properties with 255 acres in Alameda County and five properties with 59 acres in Santa Clara County were inspected. No branched broomrape was found.

Cherry Buckskin

Cherry orchards were inspected for the virus-caused buckskin disease in Butte, Stanislaus, Sutter, Tehama, and Yuba Counties. Since the cherry buckskin disease is caused by the same virus that causes the western X-disease in peach, and is related to the virus causing the yellow leaf roll disease of peach, a survey was made of all the cherry acreage in the counties where the peach trees infected with western X-disease or yellow leaf roll are being removed. A total of 10,660 trees was inspected on 56 properties. No trees infected with the cherry buckskin virus were found.

Chestnut Blight

The chestnut blight disease caused by the fungus, *Endothia parasitica* (Murr.) And. & And., has been seen in California in recent years only in San Joaquin County. Inspections of chestnut trees for this disease in San Joaquin County covered 37 acres on seven properties. Two diseased trees were found on one previously infested property, and were promptly removed.

Club Root of Crucifers

The club root disease of crucifers caused by the fungus, *Plasmodiophora brassicae* Wor., is of very limited distribution in California, and is the subject of a state interior quarantine in San Mateo County. A survey was conducted in November and December by county agricultural commissioner's office personnel of all commercial plantings of crucifers in the coastal region outside of the quarantine area in that county. Sixteen properties with 1,355 acres were inspected. Four infested properties were found; two of them within two miles of the Santa Cruz County line.

Sweet alyssum, *Lobularia maritima* Desv., plants growing in flats in a cold frame in Monterey County were found by Roy Bardin, Monterey County Plant Pathologist, to be showing symptoms and signs of the club root disease. Laboratory examination confirmed that the plants were infected with club root. Appropriate eradication measures were applied under the supervision of the



A sweet alyssum plant (*Lobularia maritima*) showing enlargement of roots caused by the club root disease fungus, *Plasmodiophora brassicae*. (Photograph by T. C. Fuller)

commissioner and the bureau, and the club root fungus is believed to have been eradicated in that county. Methyl bromide gas at the rate of four pounds per 100 square feet was applied under a tarpaulin to the flats in the cold frames, and the tarpaulin was kept in place for 24 hours. The walkways and equipment in the surrounding area were disinfected with bichloride of mercury and formalin solutions.

Cypress Canker

Inspections were made of Monterey cypress trees, *Cupressus macrocarpa* Hartn., in Golden Gate and McLaren Parks in San Francisco County to determine if the cypress canker disease, caused by the fungus, *Coryneum cardinale* Wager, was present. These inspections were made in co-operation with Nursery Service, the San Francisco County Agricultural Commissioner's Office, and the San Francisco Recreation and Park Department. A total of 9,088 trees was inspected. No infected trees were found.

Phymatotrichum (Ozonium) Root Rot

Phymatotrichum omnivorum (Shear) Dugger has been reported in California in areas of Imperial, Riverside, San Diego, and Inyo Counties. Inspections for this fungus were started in the Imperial Valley of Imperial County in the winter of 1955-56, and were continued in 1957. Personnel of the Imperial County Agricultural Commissioner's Office inspected cotton plantings, and collected specimens from suspect fields. State personnel examined the specimens to determine if the fungus was present. There were 191 plantings representing 12,365 acres inspected between October 4th and November 25th. The disease was found on 11 properties which, when added to the 10 previously known, make a total of 21 now known to be infested in Imperial Valley.

Virus Disease of Olallie Blackberry

The disorder of Olallie blackberry occurring in Stanislaus County, reported as virus-like in our 1956 Annual Report, has been diagnosed by Dr. S. Wilhelm of the University of California as the Logan dwarf virus disease.

The commercial plantings of Olallie in Merced County, 15 acres on four properties, were inspected for this disease, and no infected plants were found. A reinspection

was made of three of the Stanislaus County properties previously known to be infested. Additional infected plants were found on one of them, suggesting that natural spread was occurring.

Yellow Dwarf, a Virus-like Disease of Sweet Potato

The virus-like disease of sweet potato, which we are now referring to as yellow dwarf, reduces root production and causes dwarfing, vein clearing, and mottling of aboveground parts of the plant. It was described in our Annual Report of 1955 (Bull. Calif. Dept. Agr. 45 (2): 173. 1956). Inspections were made in 1957 of sweet potato transplant propagating beds in San Bernardino and Riverside Counties to determine if the disease was present. It was found in all of the 13 beds inspected in San Bernardino County and in four of the seven beds inspected in Riverside County. In the infested beds, up to 30 percent of the plants were infected, but the overall average for all infested beds was approximately 5 percent.

While no extensive field inspections were made in 1957, the disease was observed in field plantings in San Bernardino and Riverside Counties, but not in Kern County. In 1955, when more extensive field inspections were made, it was found in these three counties and seven others.

Postentry Inspections

For the protection of California crops from foreign plant diseases that may be introduced into the State on plants or plant propagating materials imported from foreign countries, the federal nursery stock plant quarantine No. 37 requires that the growers maintain certain imported plants under quarantine and subject to examination for periods of one year or longer. Inspections are made by bureau plant pathologists at intervals during detention. There were 69 shipments imported during the year, consisting of 363 plants, 4,817 cuttings, 52 scions, and 3,356 budsticks. This material, and 67 lots from previous years, received 151 inspections. Forty-one lots were eligible for release, and at the end of the year, 95 lots were still being held under quarantine. The only disease found of possible quarantine significance was an unidentified virus-like disorder of avocado seedlings from Guatemala.

Other Activities

New disease detection plant pathologists assisted with inspections for the sugar beet nematode in Imperial County, for the burrowing nematode in San Diego County, for the peach yellow bud mosaic disease in Tehama County, and for the eriophyid mite vector of the peach mosaic virus in Butte, Placer, Yolo, and Yuba Counties.* They

discovered the peach yellow bud mosaic virus disease in Sutter County. Some time also was spent investigating the European canker disease of apple in Sonoma County, the barley yellow dwarf disease in San Luis Obispo County, and an unidentified disorder (probably virus-caused) of Boysenberry in Stanislaus County.

* Details concerning these inspections are given under the appropriate subtitles.

PEACH MOSAIC

By R. L. McCLAIN, *Associate Plant Pathologist*, and
JOHN P. HILL, *Assistant Plant Pathologist*

Inspections of peach trees in Southern California for peach mosaic disease were made in Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties. They included 368,427 peach trees, of which 296,891 were inside the area under quarantine and 71,536 outside. A second inspection was made of 123,049 of these trees, of which 122,515 were inside the quarantined area and 534 outside. In nursery sales yards and growing grounds, an additional 19,634 host trees were inspected in the quarantined area and 922 outside the area. There were 989 mosaic trees found on 314 properties, of which 876 were found on 309 properties during the first inspection and 113 on 43 properties during the second inspection. As in the previous year, only one mosaic tree was found outside of the quarantined area, on a previously infected property in the Valyermo district of Los Angeles County. All mosaic trees found were removed. One mosaic tree was found on each of two nursery premises, but no other infected trees were found on or in the environs of nursery growing grounds.

A summary of properties and trees infected, by counties, is shown in Table 1.

The results of the mosaic inspections in Southern California for the period of 1936 through 1956 were shown in Table 2 of the 1956 Report.

Inspections in the area under quarantine were started on May 1st and completed on July 5th. Properties on which mosaic trees were found on the first inspection received a second inspection starting June 10th. In Riverside County, a complete inspection was made of the Calimesa, Beaumont-Banning, and Moreno Valley areas, and the commercial orchards and adjacent properties in the Elsinore-Temecula area. Inspections in San Bernardino County included a complete inspection of the Yucaipa Valley area and the commercial orchards and adjacent properties in the Ontario and Lytle Creek districts. They included a complete inspection of the area quarantined for peach yellow bud mosaic. Inspections in San Diego County were limited to commercial orchards and adjacent properties. In Los Angeles County, inspections included commercial orchards and adjacent properties, and that part of the quarantined area east of the quarantine line in the Azusa and Baldwin Park districts. They included the previously infected prop-

TABLE 1¹

Summary by Counties of Peach Mosaic Inspections in Southern California in 1957

County	Inspected		Infected with mosaic		
	Properties	Trees	New properties	Total properties ²	New cases (Trees)
Los Angeles	4,368	80,104	—	1	1
Orange	1,416	4,217	—	—	—
Riverside	3,294	124,097	38	176	737
San Bernardino	4,686	132,574	34	129	234
San Diego	134	27,435	2	8	17
Totals	13,898	368,427	74	314 ³	989

¹ Figures compiled by U. S. Department of Agriculture.

² Includes properties infected in previous years and having new tree cases in 1957.

³ Includes five properties in Riverside County infected on second inspection but not on first inspection.

erty and its environs in the Baldwin Park district.

Inspections were started in a barrier zone three to four miles wide along the western boundary of the peach mosaic quarantined area, partly inside the quarantined area and partly outside. The area extends from the San Gabriel Mountains on the north to the Pacific Ocean on the south, plus a narrow westerly extension for a distance of approximately seven miles along the Santa Ana River in Orange County. Inspections in this barrier zone were completed from the San Gabriel Mountains on the north to the new San Bernardino Freeway (U. S. Highway 99) on the south, and in the extension of the zone in Orange County.

Inspections outside of the quarantined area were started on May 13th. In Los Angeles County, a complete inspection was made of the Valyermo district, of all commercial plantings in Antelope Valley, and of two nurseries and their environs in San Fernando Valley. In the Mojave Desert area of San Bernardino County, a complete inspection was made of the Hinkley district, and spot inspections were made in the Barstow, Apple Valley, Lucerne Valley, Hesperia, and Phelan districts. A complete inspection was made of the Fullerton-Casa Loma district in Orange County. A second inspection was made of the previously infected property in the Valyermo district of Los Angeles County and of another previously infected property in the Hinkley district of San Bernardino County. Inspections outside of the quarantined area were completed on July 31st.

In co-operation with personnel of the Entomology Research Division, USDA, ARS, collections of buds from trees of *Prunus* spp. were continued outside of the peach mosaic quarantine area to determine

further the range of the peach mosaic virus vector, an eriophyid mite (*Eriophyes insidiosus* K. & W.).* Starting in the western part of the peach mosaic area in eastern Los Angeles County, where the occurrence of the mosaic disease discontinues, the search was extended south and west into Orange County, and west and northwest into Los Angeles, Ventura and Santa Barbara Counties. Also, a search was made working north from the City of Riverside through Cajon Pass to the Mojave Desert, and to the northern slopes of the San Gabriel Mountains, thence on through the San Joaquin and Sacramento Valleys, where collections were made in Kern, Fresno, Merced, Stanislaus, San Joaquin, Yolo, Placer, Yuba, Sutter, and Butte Counties. A total of 49 bud collections was made, principally from peach. The vector mites were found to the north in a desert planting at Oro Grande near Victorville in San Bernardino County, and to the northwest (in three foothill orchards) at Valyermo, Acton, and Saugus, in Los Angeles County. None was found elsewhere. The peach mosaic disease has not been found at any of these places except at Valyermo. The known area of vector occurrence, therefore, was extended only a short distance through these collections, that is, to the northern slope of the San Gabriel Mountains and into the Mojave Desert.

Federal, state and county personnel co-operated in the overall peach mosaic project. Approximately 83 man-months (28 federal, 23 state, and 32 county) were expended, including time used in all phases of the work. The tree inspection part required 65 of the 83 man-months (22 federal, 19 state, and 24 county).

In addition to the Southern California acreage covered under this project, peach and nectarine plantings in 11 counties north of the Tehachapi Mountains were inspected for virus diseases, including yellow leaf roll, western X-disease and yellow bud mosaic. No peach mosaic was found among 3,380,483 trees inspected on 1,431 properties.

* Last year the vector mite surveys were reported under that section of the Annual Report entitled, "New Disease Detection in Co-operation with County Agricultural Commissioners."

TRISTEZA (QUICK DECLINE) OF CITRUS

By R. L. McCLAIN, Associate Plant Pathologist,

JOHN P. HILL and GORDON F. SNOW, Assistant Plant Pathologists

The work of the tristeza disease project is divided into three phases: (1) the inspection of citrus orchards for the tristeza disease; (2) inspection of all properties in

areas designated as Meyer lemon-free districts to locate and secure the removal of all Meyer lemon plants from them; and (3) the testing of all Satsuma mandarin orange trees

in the Meyer lemon-free districts for tristeza, and the removal of those found infected.

Approximately 153 man-months were used in the over-all activities of the tristeza disease project, of which 76 were for the citrus orchard inspections and 77 were for the Meyer lemon and Satsuma mandarin orange work. The State provided 96 of the 153 man-months (48 for citrus orchard inspections and 48 for Meyer lemon and Satsuma mandarin orange work). The counties provided 57 of the 153 man-months (28 for citrus orchard inspections and 29 for Meyer lemon and Satsuma mandarin orange work).

Citrus Orchard Inspection

Inspection of citrus orchards for tristeza disease by state and county personnel included approximately 46,000 acres, primarily oranges, in 10 counties; namely, Butte, Glenn, Kern, Los Angeles, Orange, Riverside, San Diego, Santa Barbara, Tulare, and Ventura.

Inspections were made of all orange plantings in the areas under quarantine defined as regulated (districts with no or very little disease) and in approximately 40 percent of the orange acreage in the areas designated as lightly infected.

Inspections outside of the quarantined areas included all commercial orange plantings in Butte, Glenn, Kern, and San Diego Counties, approximately half the acreage in Tulare County, and about 400 acres in the Elsinore district of Riverside County.

In the areas defined as regulated, tristeza was found during the year on only two previously infected properties west of the City of Santa Paula in Ventura County.

In the lightly infected area, the rate of spread still continues to be high in the Bryn Mawr, Redlands, and Mentone districts of San Bernardino County. On the other hand, in the Bardsdale and Sespe Canyon districts of Ventura County, there appears to be some reduction in the spread of the disease. The rate of spread in the lightly infected areas of Orange and Los Angeles Counties continues to be very slow, except on the one property in the San Fernando Valley of Los Angeles County mentioned in last year's report, where 17 new tree cases were found in 1957. Limited observations in Riverside County indicated that spread there is very slow.

Inspections in the heavily infected area were limited to general observations on the

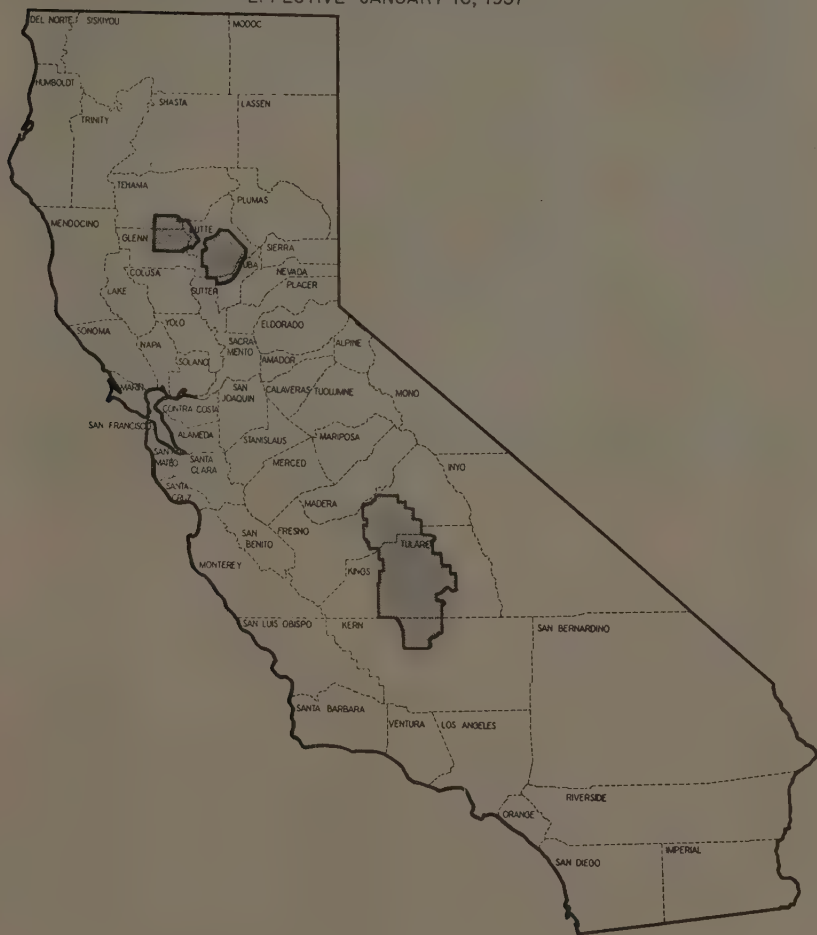
behavior and spread of the disease. These observations indicated a continued rapid spread in western San Bernardino County and in the Yorba Linda area of Orange County. However, spread in central and southern Orange County continues to be at a low rate.

No additional properties containing diseased trees were found during 1957 in the San Joaquin Valley (outside of the quarantined areas) in Tulare and Kern Counties. However, on the three previously known infected properties in Tulare County mentioned in last year's report, additional infected orange trees were found and removed. A total of 12 infected trees has been found to date on the property near Richgrove, and eight on the property near Lindsay. The affected trees on these two properties had been topworked during the previous three years with budwood obtained from the third property near Woodlake in Tulare County. The trees in the Woodlake orchard were not showing typical tristeza symptoms because of tolerant rootstock combinations. Transmission tests, started in 1956 and continued in 1957, thus far have shown 20 infected trees in this orchard out of approximately 384 on which tests either have been completed or are in progress. It is planned to test all of the trees in the orchard. About 500 are yet to be tested. No additional infected trees were found in the one orchard in northern Kern County, mentioned in last year's report, where 23 infected trees were found and removed during 1956. Repeated inspections have shown no evidence of natural spread of tristeza in these orchards, or elsewhere in the San Joaquin or Sacramento Valleys.

County departments of agriculture and county agricultural extension services assisted in reporting trees suspected of having tristeza. Members of the staff of the Citrus Experiment Station assisted in interpreting laboratory and transmission tests, in making some of these tests, and in examining diseased trees.

Laboratory tests in connection with diagnosis were made of bark and rootstock samples from 87 trees and of rootstock samples only from an additional 28 trees. Transmission tests were made from 185 orchard and dooryard trees by making tissue grafts from them into Mexican lime seedlings in a glasshouse and observing the seedlings for symptoms.

**MEYER LEMON FREE DISTRICTS
SACRAMENTO AND SAN JOAQUIN VALLEYS
EFFECTIVE JANUARY 16, 1957**



Approximately 68 percent of the orange acreage of the State is now in the quarantined areas. There has been a reduction of acreage in the quarantined areas due to causes other than tristeza.

Meyer Lemon Removal

The purpose and scope of the Meyer lemon program was outlined in the 1956

report. Meyer lemon plants are removed to eliminate them as reservoirs of the tristeza virus and thereby prevent the spread of the virus from them to the commercial citrus plantings.

The first inspection of the Meyer lemon-free districts to locate Meyer lemon plants in them was completed in February, 1957. There were 4,263 Meyer lemon plants found



Mexican lime seedlings, used as "guinea pig" test plants, being examined by Assistant Plant Pathologist Gordon F. Snow for symptoms of tristeza disease.

on 3,000 properties. The removal of Meyer lemon plants began in March, 1957.

A second inspection of the Meyer lemon-free districts is necessary to locate and remove any Meyer lemon plants that may have been missed, or brought into the area after the first inspection. The second inspection has been completed in the Counties of Glenn, Yuba, and Kern. As a result, 44 additional trees were found on 36 properties, representing more than 10 percent of the number found during the first inspection. These findings emphasize the need for re-inspecting the Meyer lemon-free districts.

The total number of Meyer lemon plants found in all Meyer lemon-free districts as of December 31, 1957, was 4,307, and they were on 3,036 properties. The co-operation of the Meyer lemon owners has resulted in the removal of approximately 95 percent of the trees found thus far in the districts. The results of the inspections and the removals are shown by counties in Table 2.

Satsuma Mandarin Orange Testing

Many Satsuma mandarin orange trees are carriers of the tristeza virus. In order to pre-

serve the benefits derived from the removal of Meyer lemon plants in the Meyer lemon-free districts, it is necessary to find and remove all infected Satsuma trees. The only feasible method of determining which Satsumas are infected is to test each individual tree. Transmission tests, using young Mexican lime seedlings as indicator plants, were made to find the tristeza-infected Satsuma trees. The testing thus far has been confined to trees in commercial groves and to trees used as sources of budwood.

There were 2,916 Satsuma trees found during the Meyer lemon inspections, and 2,329 of them were in commercial plantings in Butte County. An additional 587 were in dooryard plantings. An estimated 8,500 more Satsuma trees of various ages are growing in nurseries in the Meyer lemon-free districts. Investigation of the budwood source trees of 4,400 of them has revealed that the 4,400 most likely are not infected, since tests have indicated that the source trees are free of the virus. About 4,100 other nursery trees, however, were budded from trees in groves which subsequently were proved to contain infected trees. Although none of the 4,100 nursery trees have been tested, it is

TABLE 2

Summary of Meyer Lemon Inspections and Removals as of December 31, 1957

County	Meyer lemon properties				Meyer lemon plants			
	Total	Cleared	Remain	Percent cleared	Total	Removed	Remain	Percent removed
First inspection								
Butte	637	478	159	75.0	875	675	200	77.1
Fresno	525	524	1	99.8	631	630	1	99.8
Glenn	183	183	—	100.0	224	224	—	100.0
Kern	130	130	—	100.0	170	170	—	100.0
Tehama	9	9	—	100.0	12	12	—	100.0
Tulare	1,500	1,489	11	99.2	2,334	2,322	12	99.4
Yuba	16	14	2	75.0	17	15	2	84.0
Totals	3,000	2,827	173	94.2	4,263	4,048	215	94.7
Second inspection (incomplete)								
Glenn	25	25	—	100.0	28	28	—	100.0
Kern	8	8	—	100.0	10	10	—	100.0
Yuba	3	2	1	66.6	6	4	2	66.6
Totals	36	35	1	97.5	44	42	2	95.4
Grand Totals	3,036	2,862	174	94.2	4,307	4,090	217	94.9

known that some were budded from infected trees. Therefore, it is likely that some of the nursery trees also are infected.

In 1957, there were 434 Satsuma trees tested for the tristeza virus. Final readings of 130 of them have shown 40 to be in-

fectected, while 90 appeared to be free of the virus. Tests of 233 of the 434 are as yet incomplete, and 71 of the tests failed and must be repeated, either because of ineffective inoculation grafts or because the test trees died.

PEACH YELLOW LEAF ROLL AND WESTERN X-DISEASE OF PEACH

ARCHIE SCHLOCKER, *Associate Plant Pathologist*

Yellow leaf roll and western X-disease are two disorders of peach caused by closely related viruses or virus complexes. Although these diseases have certain symptoms in common, usually they can be distinguished from each other because of the more severe effects produced by the yellow leaf roll virus and its faster rate of movement through a peach tree and through an orchard, as compared with the western X-disease virus.

Statewide inspections since 1950 for yellow leaf roll and western X-disease have resulted in finding new tree cases of both diseases in Butte, Sutter, and Yuba Counties each year, and in Placer County for three years, 1951-1953. Since 1953, only western X-disease has been found in Placer County. During the eight-year period, 1950-1957, inspections have shown western X-disease to occur in 10 other counties, additional to the four already mentioned. They are Contra Costa, Glenn, Los Angeles, Merced, Napa,

San Joaquin, Solano, Stanislaus, Tehama, and Yolo.

During 1957, state and county personnel inspected approximately 3,392,438 peach and nectarine trees for yellow leaf roll and western X-disease on 1,617 properties in Butte, Los Angeles, Merced, Placer, Stanislaus, Sutter, Tehama, and Yuba Counties. The results are shown in Table 3.

All of the yellow leaf roll and western X-disease trees in Butte, Sutter, and Yuba Counties were destroyed promptly under the supervision of the county agricultural commissioners, usually within 24 hours after their detection. The western X-disease trees in other counties were expected to be removed before the start of the next growing season.

A decrease in the annual number of new tree cases of yellow leaf roll from 1,029 in 1951 to 56 in 1957 brought the incidence of yellow leaf roll to its lowest point since the start of the suppression project. (Statistics

TABLE 3
Summary by Counties of Inspections for Peach Yellow Leaf Roll and Western X-Disease in 1957

County	Inspected		Yellow leaf roll			Infected		Properties		Western X-disease	
	Properties	Trees	New	Total ¹	Trees	New cases	Total cases	New	Total ¹	New cases	Total cases
Butte	225	372,824	1	3	17	17	---	3	21	28	28
Los Angeles	238	65,225	---	---	---	---	---	---	---	---	---
Merced	9	212,778	---	---	---	---	---	1	2	5	5
Placer	3	23,727	---	---	---	---	---	---	1	3	3
Stanislaus	146	340,718	---	---	---	---	---	9	9	12	12
Sutter	774	1,652,942	3	10	31	31	---	9	28	34	34
Tehama	52	84,236	---	---	---	---	---	4	13	22	22
Yuba	170	639,988	1	3	8	8	---	6	15	18	18
Totals	1,617	3,392,438	5	16	56	56	---	32	89	122	122

¹ Includes properties infected in previous years and having new tree cases in 1957.

for the period 1950-1956 were shown in Table 5 of the 1956 report.) Concurrently, there was a sharp decline in the total number of yellow leaf roll-infected properties from a peak of 167 in 1953 to 16 in 1957, the smallest number since 1950. At the same time, the number of newly infected properties on which the disease was found for the first time decreased from 105 in 1953 to five in 1957, representing the lowest number thus far. These downward trends in the incidence of yellow leaf roll indicate a significant reduction in the spread of the virus in the affected areas.

Inspections began on June 3rd and were terminated on October 10th. Tree-by-tree inspection was made of the entire commercial peach and nectarine acreage in Butte, Sutter, and Yuba Counties, and of the commercial plantings in the Bear River district of Placer County. Reinspections were made periodically during the season on properties where yellow leaf roll was found earlier during 1957 or in previous years. In the first inspection, 30 yellow leaf roll trees were found on 13 properties, and 111 western X-disease trees on 83 properties. Twenty-four additional yellow leaf roll trees on five properties, and nine western X-disease trees on eight properties, were found during the second inspection of approximately 590,107 trees on 248 properties in Butte, Sutter, and Yuba Counties. A third examination of about 145,718 of these trees on 49 properties revealed a new tree case of yellow leaf roll in one orchard and two of western X-disease in two other orchards. Another yellow leaf roll tree was found when 28,756 trees on 11 properties in Butte and Sutter Counties were inspected for the fourth time.

In Merced and Stanislaus Counties inspections began in orchards with a previous his-

tory of western X-disease, and were followed by examination of all commercial plantings not inspected in 1955 or 1956. This concluded the three-year program to inspect Merced County's entire commercial peach and nectarine acreage. All of the commercial peach and nectarine acreage of Merced and Stanislaus Counties had been inspected previously under a similar program which was completed in Merced County in 1953, and in Stanislaus County in 1954. Approximately 12,900 acres remain to be inspected before Stanislaus County's entire commercial peach and nectarine acreage is completed for the second time. Altogether, since 1950, inspections in these two counties have revealed 25 western X-disease trees on 11 properties in Merced County, and 56 western X-disease trees on 40 properties in Stanislaus County.

Inspections in Tehama County included the entire commercial peach and nectarine acreage.

In Los Angeles County, inspections for yellow leaf roll and western X-disease were confined to the Valyermo and the Little Rock districts in Antelope Valley, and were made in conjunction with the inspections for peach mosaic under the peach mosaic suppression project. No new tree cases of western X-disease were found in 1957 at Valyermo, where an infected tree was discovered in 1954, and another one in 1956.

Approximately 84 man-months were expended on the tree inspections alone; the county and State contributions were about equal. In addition, about 19 man-months were spent by the State on technical assistance, training of inspectors, clerical work, map making and field administration, while about seven man-months were expended by the co-operating counties in administrative and other activities connected with the project.

PEACH YELLOW BUD MOSAIC

ARCHIE SCHLOCKER and R. L. McCLAIN, *Associate Plant Pathologists*, and
JOHN P. HILL, *Assistant Plant Pathologist*

Prior to 1957, peach yellow bud mosaic disease had been found only in El Dorado, Napa, Nevada, Placer, San Bernardino, Solano, Yolo, and Yuba Counties. In 1957, the disease was found on three properties in Butte County, on one in Sutter County, and on two in Tehama County.

State and county personnel co-operated in the inspection of approximately 242,750 peach and nectarine trees in nine counties of Northern and Central California, and in San Bernardino County in Southern California. Results are shown in Table 4.

TABLE 4

Summary by Counties of Peach Yellow Bud Mosaic Inspections for 1957

County	Inspected		Infected with yellow bud mosaic		
	Properties	Trees	New properties	Total properties ¹	New cases (trees)
Butte	74	86,754	3	3	147
Fresno	1	3,932	—	—	—
Napa	8	2,759	—	—	—
Placer	39	17,213	—	1	4
San Bernardino	822	20,739	—	3	7
Solano	6	8,325	—	1	8
Sutter	5	3,579	1	1	4
Tehama	5	21,799 ²	2	2	5
Yolo	1	23,741 ²	—	—	—
Yuba	15	53,909	—	—	—
Totals	976	242,750 ²	6	11	175

¹ Includes some properties infected in previous years and having new tree cases in 1957.

² Includes trees in close-planted nursery rows.

The detection of yellow bud mosaic in Sutter and Tehama Counties was made near the close of the regular inspection period when adequate diagnostic symptoms of the disease were becoming scarce. Immediately following these detections, a tree-by-tree inspection was made of the two affected properties and of their immediate environs. No additional tree cases were found in Sutter County, but in Tehama County an infected tree was located in another orchard, near where the first infected trees had been discovered.

Many of the infected trees in Butte County showed evidence of having been infected with the virus for a number of years. Approximately 1,900 acres in the Gridley area remain to be inspected before inspection of the entire commercial peach and nectarine acreage in Butte County is completed.

Examination of peach trees in the Bear River district of Placer County revealed four infected trees on a previously infected property. Other inspections in Placer County were limited to nursery growing grounds and their immediate environs. No yellow bud mosaic was found in or near nursery growing grounds.

All peach and nectarine trees in the areas quarantined for the disease in the Cucamonga and Lytle Creek districts of San Bernardino County were examined in conjunction with the regular annual inspections for peach mosaic. Four new tree cases of yellow

bud mosaic were found on three previously infected properties during the first inspection, and a reinspection revealed three additional tree cases on two of them. The seven infected trees were destroyed under supervision of the county agricultural commissioner.

The Yuba County inspections were confined to the commercial peach and nectarine acreage of the Wheatland district consisting of about 600 acres. For the third consecutive year, no yellow bud mosaic was found in the Wheatland district, where 13 infected trees had been found in two commercial orchards during 1954.

The inspections in Napa County were limited to a previously infected property and its environs north of Napa, and one planting just south of Napa. No yellow bud mosaic was found.

The Solano County inspections were limited to a previously infected experimental planting and five commercial orchards in its immediate environs. Eight new infected trees were found in the experimental planting.

In Fresno County, no yellow bud mosaic was found in an experimental stone fruit planting to which the inspections were limited.

The orchard tree inspections in the 10 counties required the expenditure of approximately 12 man-months, divided almost equally between the State and the co-operating counties.

VIRUS-FREE NURSERY STOCK *

By H. KEITH WAGNON, *Associate Plant Pathologist,*

H. E. WILLIAMS and A. A. MILLECAN, *Assistant Plant Pathologists, and*

J. A. TRAYLOR, *Junior Plant Pathologist*

Nurserymen and fruit and nut growers have continued to recognize the need for virus-free planting material if uniform and fully productive orchards and vineyards are to be established and maintained. The use of virus-infected nursery stock can result in economic losses. Infected trees or vines may not be productive, and, at the same time, they may be a means of introducing serious virus diseases into areas where they did not previously occur.

Leaf symptoms provide the best means of detecting those virus diseases which can be seen in nursery stock. The inspection of deciduous nursery stock during or after digging time, when leaves are absent, provides little opportunity to detect virus diseases. The best means of obtaining virus-free nursery stock is to use virus-free propagating source materials, and to grow the stock under conditions whereby it will not be exposed to infection. Some of the basic problems involved are: (1) learning which virus diseases are present, and how to detect them in nursery stock and mature plants of the different varieties concerned; (2) finding sources of each of the many varieties, grown by the nurserymen, which can be shown to be free of viruses by visual inspection and indexing methods; (3) establishing and maintaining propagating source plantings in a virus-free condition; (4) devising nursery practices for the growing of stock which will remain free of virus diseases until it reaches the consumer.

Visual inspections in conjunction with index transmission tests have helped in gaining information on the virus diseases present in California stone fruit and grape plantings. Index tests are made on selected hosts as a means of identifying the causal agent when symptoms of unknown cause are found. These tests presently are being carried on in two isolated plots. During 1957, approximately 1,601 clones of stone fruits and grapes were indexed. The majority of these tests was for detecting peach

ring spot virus in stone fruit trees. A separate plot is maintained as a repository for virus-free trees and vines. This repository serves as a source of material from which "guinea pig" test plants are propagated, and also as a means of determining the feasibility of maintaining propagating material in a virus-free condition.

Instruction and training in the detection of virus and virus-like diseases, including the demonstration of these diseases, were given in the field to state and county inspectors, growers, and nurserymen. Progress in the work has benefited materially by a continued close co-operation with members of the United States Department of Agriculture, the University of California Agricultural Experiment Station, the county agricultural commissioners, Nursery Service in the California Department of Agriculture, horticulturists, nurserymen, fruit tree breeders, and growers. Plant pathologists from the States of Maryland, Utah, and Washington and from British Columbia, Canada, visited with members of the bureau in California for the purpose of exchanging information on specific diseases and technical methods.

Activities during the year extended into 23 counties and involved 43 nurserymen. Commodities covered were cherries, peaches, nectarines, almonds, plums, prunes, apricots, and grapes.

Cherries

Nine nurseries which produce the bulk of the cherry nursery stock in California have continued their interest in establishing three mother blocks which now meet the requirements of the regulations adopted in 1956 for registration. These three blocks contain 90 trees involving 17 clones of seven varieties. In addition to the seven varieties in the mother blocks, two clones of mahaleb rootstock seed trees established separately are expected to be eligible for registration, and they will provide a source of seed. Cherry nursery stock certified to be free of serious virus diseases is expected to be available to the cherry industry of California in the near future.

* For this project state funds were matched with federal funds received from the Agricultural Marketing Service, U. S. D. A., under provisions of the Agricultural Marketing Act of 1946.

Pending the development of a supply of indexed material, the cherry budwood sources used at present by most nurserymen consist of private budwood blocks, commercial orchards, and one planting of cherries maintained solely for the production of budwood being offered for sale to nurseries. Inspections of these sources included 4,761 tree examinations on 24 properties, and 53 trees were rejected as unfit for propagating use. Diseases encountered included ring spot, crinkle leaf, and deep suture.

Peaches and Nectarines

Previous work with peaches and nectarines has shown that ring spot and peach necrotic leaf spot viruses are prevalent in plantings of these fruits in California, but cannot always be detected by visual inspection. Therefore, more emphasis was placed on detection of these two viruses by combining visual inspections with other procedures. Index tests to determine the presence of ring spot are made on Shiro-fugen flowering cherry, whereas the presence of peach necrotic leaf spot may be determined by visual inspections of June-budded progeny trees.

Inspections of peach and nectarine budwood sources included 30,226 tree examinations on 29 properties, and 639 trees were rejected as unfit for propagating use. Diseases encountered were peach necrotic leaf spot, peach ring spot, western X-disease, peach blotch, stubby twig, yellow bud mosaic, and peach stunt.

Almonds

Almond budwood source inspections included 3,929 tree examinations on eight properties, and eight trees were found unfit for propagating purposes. Nursery-row inspections included several almond varieties and 3,500 progeny trees for which the identity of parent source trees had been maintained; 500 of the progeny trees (Texas variety) showed ring spot symptoms. Ring spot is caused by a virus that will induce visual symptoms on some varieties of almonds under certain environmental conditions, but indexing on Shiro-fugen flowering cherry and certain other stone fruit hosts often is necessary to detect the virus in infected trees.

Diseases found in almonds included almond calico, bud failure, and ring spot. At least one variety now in commercial use

appeared to be infected with ring spot virus in all tests made.

Plums and Prunes

Inspections of plum and prune budwood sources involved 4,423 tree examinations on 28 properties, and 37 trees were rejected as unfit for propagating use. Additional inspections also were made of approximately 7,700 trees of two plum varieties maintained in special blocks for the production of cutting-grown rootstocks. Diseases encountered included diamond canker, line pattern, and several leaf spot disorders which tentatively are regarded as genetic abnormalities.

Workers in the Eastern United States and Canada have reported the presence of visual symptoms useful for detecting ring spot in some prune and plum varieties. During the work of this project, visual inspections and index tests on various plum and prune varieties have not revealed any visible leaf symptoms of ring spot under California conditions. However, index tests of 103 clones on Shiro-fugen cherry showed 29 of the clones to be infected with the virus. Several nurserymen are attempting to establish ring spot-free propagating sources of plums and prunes, including rootstock sources.

Apricots

Visual inspections of apricot propagating sources involved 2,223 tree examinations on 18 properties. No recognizable symptoms of virus diseases were found. Visual inspections in previous years have revealed relatively few viruses in apricot budwood source trees. However, some growing nursery stock, particularly when grafted onto Marianna 2624 and Myrobalan 29C rootstocks, has shown faint oak-leaf type symptoms suggesting line pattern. Such symptoms rarely have been encountered in orchard trees. Further index work is needed before the occurrence of line pattern in apricot can be properly evaluated.

Index tests for ring spot on Shiro-fugen flowering cherry were made on 33 clones of apricots, and only one clone gave a positive reaction for the virus. During the work of this project, no leaf symptoms definitely attributable to ring spot virus have been observed on apricot.

A single budwood source apricot tree in Fresno County was found in 1954 to show symptoms suggestive of ring pox, and it later was found by index tests to be infected

with the ring pox virus. Apricot ring pox is a potentially serious disease which recently has become a problem in Riverside County, California.

Grapes

Inspections of grapevines involved 141,794 vine examinations on 55 properties, with the result that 2,110 vines were found unfit for propagating use. Grapevine nursery stock source inspections were made for 30 propagators in 18 counties. Emphasis was placed on the examination of those commercial source plantings, submitted by co-operating nurseries, which had not been inspected previously. Diseases encountered were fanleaf, leaf roll (white Emperor disease), yellow mosaic, yellow vein, and Pierce's disease.

Field inspections the past two seasons have indicated that a high percent of grape rootstock sources in California contain virus diseases. Under California conditions, early spring appears to be the best time for the detection of most viruses in grape rootstocks. During 1957, early spring visual inspections of 6,059 vines in 13 sources of the rootstock variety, *Rupestris* St. George, showed the fanleaf virus to be present in slightly less than 16 percent.

Fanleaf is one of the most serious virus diseases of grapes in California. Observations indicate that there are mild and severe strains of the virus. Visual examination of grapevines for the detection of fanleaf becomes increasingly difficult as the growing season progresses. Factors, including environment, insect damage, cultural practices, and chemicals applied as fungicides, herbicides, and growth regulators all contribute to confuse and mask the symptom picture.

Leaf roll virus of grapevine is now of considerable concern, as recent work has shown the disease to be more widespread than previously thought. Some grape varieties apparently are symptomless carriers, whereas

others appear to produce symptoms one year and not another. Diseased vines may show a reduction in the total sugar content of the berries. In some dark-skinned varieties, the berries fail to attain normal coloration. Considerably more information is needed on the host range and symptom picture of the grapevine leaf roll virus.

A better understanding of yellow vein and yellow mosaic viruses is needed. Because of the overlapping of some symptoms, it sometimes is difficult to determine with accuracy which of the two viruses is present. As in the case of fanleaf, these two viruses may result in the production of sparse clusters with irregularly sized berries.

Disorders other than the recognized virus diseases referred to above also are encountered and affected vines then are rejected for propagating use. Such disorders include genetic and virus-like abnormalities, unproductive vines, and weak vines, all of which are regarded as possibly bud-perpetuated. Some of these conditions could be caused by viruses or combinations of viruses, which at present are unknown or undescribed.

Clonal lines of grapevines have been made available for a grape registration program by workers of the University of California Agricultural Experiment Station, and foundation blocks for maintaining sources of registered clone material have been established. Nine nurserymen have applied to participate in the registration program, for which regulations were adopted by the California Department of Agriculture in 1956; and eleven grape mother blocks have been set out. Examinations of the nursery mother blocks, and also of the foundation blocks, have revealed the presence of leaf roll, yellow vein, and fanleaf in some of the clones. These findings indicate that further refinements are needed for the detection of these viruses in the registration program, and perhaps also for maintenance of clones in a virus-free condition.

GENERAL PLANT PATHOLOGY LABORATORY

C. G. WEIGLE and ALEX M. FRENCH, *Associate Plant Pathologists*, and
T. G. SCANDONE, *Assistant Plant Pathologist*

Plant disease diagnostic laboratories are maintained at Sacramento and Riverside. Many of the specimens received involve plants moving in intra- and interstate shipments. A determination as to presence or absence of disease is important, because

quarantine or other regulatory action may be required. Also, the wide variety of plant material examined supplies valuable information regarding the type and prevalence of diseases already present in the State and of diseases moving into the State.

Of the 3,135 specimens examined during the year for conditions caused other than by nematodes, 2,697 were received in the Sacramento laboratory, and 438 in the Riverside laboratory. Most of the specimens were submitted by county agricultural commissioners and their staffs. Some were submitted by members of other agencies, or by growers, or were brought in from the field by members of the bureau. There were 353 sent in from border stations by inspectors of the Bureau of Plant Quarantine. In addition to the laboratory examinations tabulated in this report, many examinations and determinations were made in the field by members of the bureau.

Plant disease occurrences and diagnoses of unusual interest during 1957 included:

Crown gall caused by *Agrobacterium tumefaciens* (E. F. Sm. & Towns.) Conn on *Artemisia* sp. shipped from Missouri. According to our records, this is a newly found host for crown gall.

Fasciation and severe stunting of geranium, *Pelargonium domesticum* Bailey, by *Corynebacterium fascians* (Tilford) Dowson.

Branch dieback caused by *Verticillium albo-atrum* Reinke & Berth. on Chinese elm, *Ulmus parvifolia* Jacq. We find no previous record of *Verticillium* wilt affecting this plant.

Widespread and damaging infection of tomato, *Lycopersicon esculentum* L., transplants in southern coastal counties caused by *Alternaria solani* (Ell. & G. Martin) Sor., resulting in collar rot, stem cankers, and foliage and fruit infection in the field.

Fusicladium sp. causing a previously unreported leaf spot or scab disease on *Raphiolepis indica* Lindl. in a wholesale nursery.

Necrotic leaf spotting of tomato by *Stemphylium* sp. in southern coastal counties.

Root and crown rot caused by *Armillaria mellea* Vahl. ex Fr. killing parkway planting of weeping willow, *Salix babylonica* L. We consider this a new host for this fungus.

Needle dieback resulting in serious economic loss in stands of Ponderosa pine, *Pinus ponderosa* Dougl., in the San Bernardino National Forest, thought to be caused by atmospheric pollutants.

Severe injury in several large shipments of young apple trees by a chemical defoliant applied in nurseries to offset delayed leaf fall induced by warm fall weather.

A genetic leaf variegation in a large commercial aster planting. The condition apparently was perpetuated through the grower's practice of repeated propagation with his own seed stock.

Several diseases which are not new or uncommon, but are considered to be serious, were found in nursery stock, either during shipment or on nursery properties. These were:

Azalea flower spot caused by *Ovulinia azaleae* Weiss in material from three nurseries in central coastal counties.

Armillaria infection of young prune trees in one nursery, and of deodar cedar in another.

Verticillium albo-atrum Reinke & Berth. in branches of apricot trees from one nursery and in rose seedlings from another.

Sclerotinia sclerotiorum (Lib.) DBY. in gladiolus bulbs in an importation from a foreign country.

Sclerotium rolfsii Sacc. on gladiolus bulbs.

Bacterial fasciation caused by *Corynebacterium fascians* (Tilford) Dowson in petunia stock. All of the plants in the lot were infected.

Following are tabulations of laboratory specimens based on the type of host plant and the causal factor involved. In a number of instances, specimens submitted for examination were affected by more than one causal factor.

Crop category	Number of specimens
Tree fruits, nuts, and grapes.....	1,050
Vegetables.....	663
Flowers and herbaceous ornamentals.....	317
Ornamental shrubs and vines.....	290
Small fruits.....	126
Forest and shade trees.....	335
Cereal, forage, and field crops.....	143
Miscellaneous (soil, turf, weeds, etc.).....	211
Total.....	3,135

Causal factor	Number of instances
Fungi.....	1,191
Bacteria.....	193
Viruses.....	112
Parasitic flowering plants.....	21
Disease or condition not caused by organisms.....	1,181
Referred to other bureaus or agencies (insects, chemicals, etc.).....	75
Disease-free or negative for specified examination.....	337
Undetermined.....	49
Total.....	3,159

PLANT PARASITIC NEMATODES

By W. H. HART, Associate Plant Pathologist (Nematology), and JAMES R. BREECE, Assistant Plant Pathologist

The work in plant nematology involves both field and laboratory activities. It consists of technical assistance, to county agricultural commissioners and to other bureaus in the department, in connection with a wide range of problems concerned with plant parasitic nematodes.

Plant and soil materials suspected of harboring plant parasitic nematodes are examined at the Sacramento and Riverside laboratories. Material submitted for examination may originate in orchards or fields, from nursery growing grounds within the State, and from shipments of nursery stock

entering the State. There were 2,452 specimens received in Sacramento, and 30 in Riverside, for nematode examination. An additional 938 samples were received and examined at a temporary laboratory at El Centro in Imperial County.

Nematodes most commonly found include the root knot nematodes, *Meloidogyne* spp.; the root lesion nematodes, *Pratylenchus* spp.; the stem and bulb nematode, *Ditylenchus dipsaci* (Kühn) Filipjev; and the cyst forming nematodes, *Heterodera* spp.

The sugar beet nematode, *Heterodera schachtii* Schmidt, an important parasite of sugar beets already established in most of California's sugar beet areas, was discovered for the first time in the Imperial Valley area in 1957, where it was found on seven properties.

Following a report of the presence of the nematode in two fields, a survey was made in co-operation with the County Agricultural Commissioner of Imperial County, the sugar beet companies operating in the area, and the growers. A temporary laboratory was furnished in El Centro by the Imperial County Department of Agriculture, staffed by state and county personnel. Composite samples of sugar beet roots and soil were collected from approximately 11,000 acres then in sugar beets for the 1956-57 growing season. This acreage represented 203 fields belonging to 114 growers. The presence of the sugar beet nematode was confirmed in the two previously reported fields.

The nematode was found during the survey in three additional fields and, subsequently, in two more fields newly planted to sugar beets for the 1957-1958 season. In these two fields, areas of poor growth caused by the nematode demonstrated that the high summer temperatures in the area are not sufficient to inhibit the development of the nematode to damaging numbers under local normal farming practices.

Two species of cultivated primrose, *Primula obconica* Hance and *P. malacoides* Franch, in a retail nursery, were found to be infected by a nematode identified as a form of the stem and bulb nematode, *Ditylenchus dipsaci*. The only previous report of this nematode on primrose in the United States appears to be by N. A. Cobb, from Pennsylvania in 1928 (U. S. Dept. Agr. Plant Disease Reporter 12:11).

An investigation was made to determine the source and extent of the California in-

festation. Samples were collected by county agricultural inspectors and by state nursery inspectors. Infected plants were found in a few propagating nurseries and in many retail nurseries. Seed still available at certain propagating nurseries was found to contain the nematode. Examination of seed supplied by wholesalers and importers revealed that the nematode was present in only a single original lot of *P. obconica* seed which had originated in Italy. Other seed lots examined, but found not to be infested, had originated in Germany, Holland, and France. The remaining seed of the infested lot and infected plants propagated from this seed were destroyed. A total of 428 samples, composed of 296 from primrose plants and 132 of primrose seed, was examined. Plant samples were usually composites representing a few to many hundred potted or flatted plants. Of all the samples examined, 78 plant samples and 10 seed samples were found to contain the nematode. Infection of *P. malacoides* was found only once, when it appeared to be the result of contamination from adjoining infected *P. obconica* plants. The containment of this pest was aided by early detection made possible by the obvious injury and loss of infected plants at the nursery level. Plants rapidly became unsalable, through death or through distortion and death of infected leaves and flowers.

No additional infestations have been found in new seed lots imported for the 1957-1958 season.

A new ectoparasitic nematode, *Hemicycliophora* sp., associated with fleshy galls on roots of rough lemon, *Citrus limon* (Linn.) Burm. (*C. limonia* Osbeck), was reported to the bureau by S. D. Van Gundy of the University of California at Riverside. Root galls, apparently induced by this nematode, were present on nursery trees and replants on a property in Riverside County. The over-all effects of the nematode on the young trees, and the host range of the nematode, are not yet known. The condition was described by Van Gundy in 1957 (U. S. Dept. Agr. Plant Disease Reporter 41: 1016-1018).

Pratylenchus brachyurus (Godfrey) Filipjev, one of the root lesion nematodes, was not known to occur in California before 1956, when an infestation was found on cotton in Kern County. In 1957, a second infestation, also on cotton, was found in Riverside County. Both infestations are being contained pending possible eradication.

The examination of roots of certain imported plants which are hosts of the burrowing nematode, *Radopholus similis* Cobb, and of plants propagated from such stock, was continued in 1957. The nematode was found in 25 of 492 specimens examined. Infested incoming shipments were rejected or destroyed. Three limited infestations of the burrowing nematode were found in ornamental tropical plants in containers on nursery properties in San Diego, San Francisco, and Alameda Counties. Infected plants were destroyed and the premises were treated to eradicate the nematode. At present there are no known infestations of this nematode in the State.

Following is a list of the kinds of specimens received and the relative number in each kind:

Crop category	Number of specimens
Tree fruits, nuts and grapes.....	266
Vegetables	80
Flowers and herbaceous ornamentals.....	764
Ornamental shrubs and vines.....	126
Small fruits	697
Forest and shade trees	20
Cereal, forage, and field crops.....	68
Soils	291
Miscellaneous (turf, weeds, seeds, etc.)	170
*Sugar beet root and soil samples.....	938
Total	3,420

* Examined at El Centro temporary laboratory for sugar beet nematode only.

Bureau of Plant Quarantine

A. P. MESSENGER, Chief

E. A. BREECH, Assistant Chief

The Bureau of Plant Quarantine, under authority of Sections 100 to 160; Chapter 4, Vessel and Aircraft Garbage; Agricultural Seeds, Sections 911 to 911.24; and certain other Sections of the Agricultural Code, administers and enforces state and federal plant quarantine regulations. These regulations are designed to prevent the introduction or spread of insects, plant diseases, animal and weed pests which are or may be detrimental to the agricultural industry of California.

The administrative headquarters are in Sacramento. Field offices known as plant quarantine inspection stations are maintained at 18 points near the north and east borders on the principal highways entering the State, and at the State's three major seaports. In addition, county agricultural commissioners carry on plant quarantine enforcement at eight minor ports along the California coast.

The San Francisco and San Pedro maritime stations have been designated by the Federal Plant Quarantine Division as plant quarantine inspection houses through which foreign plant propagating material may be admitted under federal permit. These stations are fully equipped to detect and eliminate pest conditions on foreign imports.

The federal phase of the maritime activity is supervised by an area supervisor lo-

cated at San Francisco. All inspectors at the three major maritime ports and at least one quarantine inspector at each of the minor maritime ports are official collaborators of the Plant Quarantine Division, U. S. Department of Agriculture, for the enforcement of laws and regulations affecting foreign countries.

Plant quarantine enforcement at interior points is carried on by County Agricultural Commissioners, deputies, and inspectors. This interior inspection activity involves inspection at terminal and destination points of plants and plant products arriving in California from other states and products being moved from one county to another within California.

Quarantines Enforced by Bureau

In all, there are 22 exterior quarantines against pests in other states, and 16 interior quarantines against pests of limited distribution in California, all established by the Director of Agriculture. In addition, there are 12 federal quarantines against pests of limited distribution in the United States, 17 federal quarantines against pests in foreign countries, and seven federal quarantines against pests in United States territorial possessions, all established by the Secretary of Agriculture. All plant quarantine regulations are enforced by California plant quarantine officers and the federal collaborators.

Changes in Quarantine Regulations

The Sweet Potato Weevil Exterior Quarantine was amended to add to the infested area one county in Alabama, five counties in Georgia, three parishes in Louisiana, five counties in Mississippi, one county in South Carolina, and to delete six counties in Georgia as being free from sweet potato weevil.

The Cherry Fruit Fly Exterior Quarantine was amended to designate the entire State of Washington as "infested area," and also to add two counties in Idaho and two counties in Montana in which cherry fruit flies now exist. The dosage schedule for treatment of fresh cherries from infested areas was increased in order to assure a lethal dosage for all stages of fruit fly.

The Hall Scale Interior Quarantine was amended to reduce the quarantined area in the City of Davis, and to lift the quarantine entirely on the Davis campus of the University of California.

Many changes were made in the list of properties infested by Khapra beetle to add, delete, and relist properties as new infestations were found or infested properties were treated. Thirty-six new properties were added, 55 properties were released, and nine were relisted.

The Walnut Husk Fly Interior Quarantine was amended to extend the quarantine

lines in Kern, Napa, and San Bernardino Counties, and to add portions of Merced, Santa Clara, and Stanislaus Counties because of newly found infestations.

A new interior quarantine was issued against Cooper's broomrape in Coachella Valley area of Riverside County, and the Niland area of Imperial County. The quarantine designates tomato plants and three desert plants known as Spanish needle, Burroweed, and Plicate coldenia as hosts and possible carriers. Shipments of host plants may be moved from the quarantined area if certified by the agricultural commissioner that the plants were produced in treated soil. Methods of treating soil to be applied under the supervision of the commissioner are outlined in the quarantine.

The Legislature adopted Section 122.5, Agricultural Code, which authorizes the Director of Agriculture to establish rules and regulations to designate certain plants, appliances, and things as possible pest carriers, in which case they would be amenable to restrictions, including holding at destination for inspection to determine their pest status. During November, hearings were held in Los Angeles, Fresno, and Sacramento to consider a proposed regulation to place feed grain under inspection for certain weed seeds. The matter was still under consideration at the close of the year.



Inspector getting instructions from Navy helicopter pilot before departure for incoming aircraft carrier. Practically all United States Navy aircraft carriers coming from the Orient or Hawaii, are boarded by helicopter 5 to 15 miles offshore.

Port Districts

Inspection stations are maintained at the three major maritime ports, San Diego, San Pedro, and San Francisco, for the purpose of enforcing federal and state plant quarantine laws designed to prevent the entrance of agricultural pests. There are eight smaller ports, Crescent City, Eureka, Hueneme, Monterey, San Luis Obispo, Santa Barbara, Stockton, and Ventura, where arriving ships are inspected by county agricultural commissioners, who also serve as federal collaborators.

Vessels and aircraft arriving from foreign and offshore points are inspected to determine compliance with federal and state plant quarantine laws. Passenger and crew baggage and their quarters, ship and aircraft stores and cargoes are examined to ascertain if quarantined material is present. When prohibited or restricted material is intercepted, appropriate safeguard action is taken.

There were 9,209 vessels and 3,762 airplanes inspected. From these, 24,653 lots of plant material were intercepted and refused entry, while 3,193 lots were treated and released. Inspection of this material revealed the presence of 15,809 lots of pests, including the following important ones.

Hawaiian Interceptions

Fruit flies, 19; bean butterflies, 22; bean pod borer, 10; green coffee scale, nine; mango seed weevil, 34; pink bollworm, one; burrowing nematode, two; giant African snail, one.

Foreign Interceptions

Fruit flies, 20; mango seed weevil, four; Asiatic rice borer, seven; sweet potato scarabee, one; citrus black fly, one; citrus white fly, three; avocado seed weevil, one; European corn borer, one; *Coccus mangiferae* scale, one; golden nematode, four; sweet orange scab, four; citrus canker, 46; canker B., one; black stem rust, two.

Interstate Interceptions

Citrus white fly, 18; rhododendron white fly, one; *Coccus mangiferae* scale, two.

There were 11,600 export certificates issued for the year, 721 less than last year.

One thousand nine hundred fifty reports were made to the State Division of Animal Industry and to the U. S. Animal Quarantine Division concerning the presence of restricted meats found on vessels. One hun-

dred forty-six permits were issued authorizing the removal of meat food stores from vessels under safeguard.

Three hundred twenty-four vessels were inspected by county personnel at the ports of Eureka, Stockton, and Hueneme. One hundred twenty-one of these vessels had prohibited or restricted items aboard.

In addition to the airplanes inspected by California inspectors, 6,635 received pre-flight clearance in Hawaii, thereby relieving California from further inspection.

The inspection of Florida airplanes and passenger baggage which was inaugurated shortly after the Mediterranean fruit fly outbreak in April, 1956, was continued until July 1, 1957. During the first half of the year, 2,300 airplanes were inspected; 114,177 passengers were interrogated about fruits being in their possession. This inspection did not disclose the presence of infested items.

Border Inspection Service

Border inspection stations are located on all major highways entering the State. There are six stations along the northern border, Smith River, Redwood Highway, Hornbrook, Dorris, Tulelake, and Alturas. The six eastern border stations are Long Valley, Truckee, Meyers, Woodfords, Topaz, and Benton. The southern border stations are Yermo, Daggett, Twentynine Palms, Vidal, Blythe, and Winterhaven.

The primary objective of the border stations is to prevent the entry of pests detrimental to the agricultural industry of the State. In order to carry out this agricultural protective program, each vehicle entering the State through the border stations is required to undergo inspection to determine that quarantined fruits, plants, plant products, or other restricted items are excluded. The type of inspection given each vehicle is based on the pest hazard presented.

During 1957, border stations inspected 4,476,857 incoming vehicles. This represents an increase of 47,626 vehicles over the previous year. Of this total of incoming vehicles, 4,052,006 were passenger automobiles, 375,800 were commercial trucks, and 49,051 were stages. Of the total passenger automobiles inspected, 2,212,383 carried California licenses, 1,839,623 were registered in other states, territories, or countries.

A total of 12,028,041 passengers entered the State through border stations, an in-

crease of 165,204 over 1956. While traffic through the northern border stations showed a rather sharp decline, the eastern and southern border stations showed an increase. The southern border group of stations again handled slightly over one-half of all highway vehicles entering the State.

Eighty-nine thousand five hundred ninety-seven lots of plant material were intercepted for violation of provisions of the Agricultural Code. Inspection of this material resulted in the finding of 29,697 lots of pests which consisted of 18,695 lots of insects, 10,691 lots of disease, and 311 lots of noxious weed seeds.

The following indicates how many times the important quarantine pests were taken in 1957: apple maggot, 510; citrus white fly, 27; cotton boll weevil, 12; cherry fruit fly, 352; Colorado potato beetle, 1; European corn borer, 56; pecan nut weevil, 8; pecan shuck worm, 58; pink bollworm, 1; plum curculio, 105; pickleworm, 3; sugarcane borer, 4; southwestern corn borer, 2; sweet potato weevil, 6; and walnut husk fly, 74; Carolina horse nettle, 2; Canada thistle, 28; hoary cress, 8; Russian knapweed, 6; and white horse nettle, 83.

Many pests not the subject of specific quarantine restrictions would prove damaging to the agricultural industry of the State should they be introduced and become established. Some of these, intercepted at border stations, were acuminate scale, black thread scale, yanone scale, Mexican bean beetle, squash borer, Forbes scale, tea scale, Howard scale, plum gouger, eastern subterranean termite, camillia scale, and Putnam scale.

Incoming and outgoing produce trucks are inspected at border stations to determine

compliance with Fruit and Vegetable Standardization laws. A total of 108,129 truckloads of produce were inspected. Thirty thousand six hundred forty-four of these trucks were inbound, and 77,485 were hauling produce out of state.

There was an increase of approximately 20 percent in the importation of feed grain over 1956. Border stations inspected trucks hauling a total of 539,629 tons of feed grain, consisting of 7,324 tons of corn, 309,242 tons of milo, 158,361 tons of wheat, 17,692 tons of barley, 38,102 tons of oats, and 8,908 tons of other feed grains.

Co-operative activities involved 35 agencies of the State or Federal Governments in 1957.

Improvement of the county highway between Amboy and Twentynine Palms in San Bernardino County provided a shorter route to some areas in the southern part of the State for travelers entering over U. S. Highway 66. This improvement resulted in increased traffic over this road, to the extent that it was necessary to assign two inspectors to Twentynine Palms to handle inspection requirements. Plans were developed for the installation of a modern inspection station on this highway approximately 10 miles east of Twentynine Palms. It is anticipated that the new station will be completed by the early part of 1959. Traffic trends indicate that by then it will be necessary to operate the station 24 hours daily.

Because of a realignment of the highway in the vicinity of Truckee, and the installation of a new type four-lane freeway, it will be necessary to construct a new station at this location for which plans are complete. It is expected that the building will be completed the latter part of 1959.

NURSERY SERVICE

WRAY F. HILTBAND, *Supervisor*

Nursery Service, under authority of Sections 15, 30, 30.5, 34.6, 100 to 160, and Chapter 9 of Division 5 of the Agricultural Code, co-ordinates and supervises the inspection of nurseries and enforcement of nursery stock grades and standards laws by county agricultural commissioners to insure uniformity, leads pest detection inspections in nurseries, assists county agricultural commissioners and nurserymen with nursery pest control and

eradication, administers optional programs for the registration and certification of plants inspected and tested for virus diseases and other pests, licenses the sale of nursery stock, and maintains a list of licensees and publishes a directory of nurserymen and others licensed to sell nursery stock. The service is supported by fees paid for licenses, registration, and certification.

New Legislation

Nurserymen sponsored two new laws, effective in 1957, to raise the standards of their industry. In one, the director is authorized to establish rules and regulations providing for periodic inspections of nurseries by county agricultural commissioners and for standards of cleanliness from pests for nursery stock. Failure to maintain nursery stock in accordance with the standards, or to comply with orders issued by the commissioner or the director, may be cause for suspension or revocation of a license to sell nursery stock.

In the other change, the nursery stock grades and standards law was repealed and a simplified version enacted. The new law includes county agricultural commissioners as enforcing officers, provides for correct labeling and for the sale of living stock not seriously damaged. Grade sizes may be established by regulations of the director.

Plant Pest Inspections in Nurseries

Pests new to the State, or serious pests of limited distribution, are required to be eradicated when found in nurseries. Since nursery stock is one of the most likely means of their introduction into or spread within the State, emphasis is placed on detection inspections to reveal such pests. Pests of general distribution are required to be kept under effective control.

Approximately 515 acres of strawberry nursery stock were grown. The acreage decreased from 800 acres in 1956, when an oversupply of plants existed. The spring dwarf nematode, *Aphelenchoides fragariae*, was found in one nursery during a statewide survey made in the spring. In the fall, root samples were taken from all nursery plantings for laboratory examination for nematodes of economic importance. Approximately 51 acres were found infested with root knot or lesion nematodes. Careful selection of land, soil fumigation, and attention to clean planting stock by nurserymen contributed to the reduction of nematode infestations to 10 percent of the total acreage as compared to 22 percent in the previous year. Movement of plants in infested areas was restricted. No red stele disease was found in strawberry nursery plantings; few plants were found infected with aster yellows virus disease.

Inspections for virus diseases were made in approximately 712 acres of deciduous fruit tree and grape nursery stock in the

growing grounds of 61 nurseries. Trees found with symptoms of serious virus diseases were rogued from the nursery row. June-budded Muir peach trees believed infected with Muir dwarf virus were restricted in movement. Grape nursery stock infected with fanleaf, yellow mosaic, and yellow vein viruses were destroyed by nurserymen. In a number of instances tree and grapevine nursery stock showing symptoms of other diseases, disorders, or mixtures of varieties were destroyed by nurserymen.

Crown gall, lesion and root knot nematodes caused heavy losses to nurserymen growing bare root nursery stock. Other losses resulted from die-back of roots caused by excessive moisture and lack of aeration in heeling-in beds, severe root damage by woolly apple aphids, and damage resulting from the use of a defoliant. Some of the severe root knot nematode infestations were attributed to the flooding of nursery plantings in the winter of 1956-57.

Olive parlitoria scale, *Parlatoria oleae*, continued to be troublesome in the San Joaquin Valley area. Repeated sprays of parathion and malathion have not been completely successful in preventing olive scale from moving into nurseries from adjacent properties.

Approximately 203,000,000 field grown tomato plants were shipped from 1,088 acres planted in southern California nurseries. During the season, 36 acres were placed under hold order because of root knot nematode, and 395 acres because of broomrape, *Orobancha ludoviciana* var. *Cooperi*. The latter pest was found parasitizing nursery stock for the first time in California. The species of broomrape occurs naturally, and attacks native hosts in the area where the tomatoes were planted.

The stem nematode, *Ditylenchus dipsaci*, was found in Primula in nurseries in the San Francisco Bay area. The nematode is seed-borne, and some infestations were traced to seed imported from Italy. Infection distorts and injures leaves and flowers. Stock showing symptoms was placed under hold order by commissioners, and destroyed.

A new species of false spider mite, *Bryobia*, was found on Scotch broom in three nurseries. The mite was later found on Scotch broom growing wild in Humboldt County.

The dark brown spruce aphid, *Cinara piceicola*, was found for the first time in California in San Bernardino County on

Norway spruce; inspection in other areas showed the aphid to be present in widely separated locations. Symptoms of fleck, a serious virus disease of Easter lily, were less prevalent than in recent years in Easter lily bulb fields, and in greenhouses where they are forced.

Prompt action was taken to eradicate or restrict movement of nursery stock carrying serious pests so as to prevent establishment or spread to other areas. Cleanup was required of 88 infestations of 19 different kinds of pests found by state and county men in California as follows:

Aphelenchoides fragariae, Spring dwarf nematode, 1; *Aspidiotus destructor*, Coconut scale, 1; *Asterolecanium arabisidis*, Pittosporum pit-making scale, 56; *Byrrhia*, new sp., Mite, 4; *Diasethus*, sp. probably violaceous, Weevil, 1; *Ferrisia virgata*, Striped mealybug, 1; *Genaparlatoria pseudaspidotus*, scale insect, 1; *Lecanium kunoensis*, Kuno scale, 3; *Orobancha ludoviciana* var. *Cooperi*, Broomrape, 3; *Parlatoria pittospori*, Pittosporum diaspidid scale, 4; *Radopholus similis*, Burrowing nematode, 4; *Sclerotium rolfsii*, Southern root rot, 1; *Taniva albolineana*, Spruce needle miner, 1; *Tarsonemus*, new sp., Mite, 1; *Trionymus diminutus*, Mealybug, 1; *Unaspis euonymi*, Euonymus scale, 2; *Virus diseases*, Peach blotch, 1; Peach mosaic, 1; Muir peach dwarf, 1.

Intensive control rather than eradication of olive scale, *Parlatoria oleae*, is now required in nurseries. Eighty-two infestations of olive scale were found in 12 counties.

Noxious weed pests found in nurseries include: Canada thistle in Alameda and Humboldt Counties; hoary cress in Los Angeles County; Klamath weed in Sacramento County; quackgrass in Alameda, Contra Costa, Humboldt, Marin, San Francisco, San Mateo, Santa Barbara, Solano, and Sonoma Counties; wavy-leaved gaura, Orange County, and white horsenettle in Los Angeles County.

Intercounty Nursery Stock Certificates

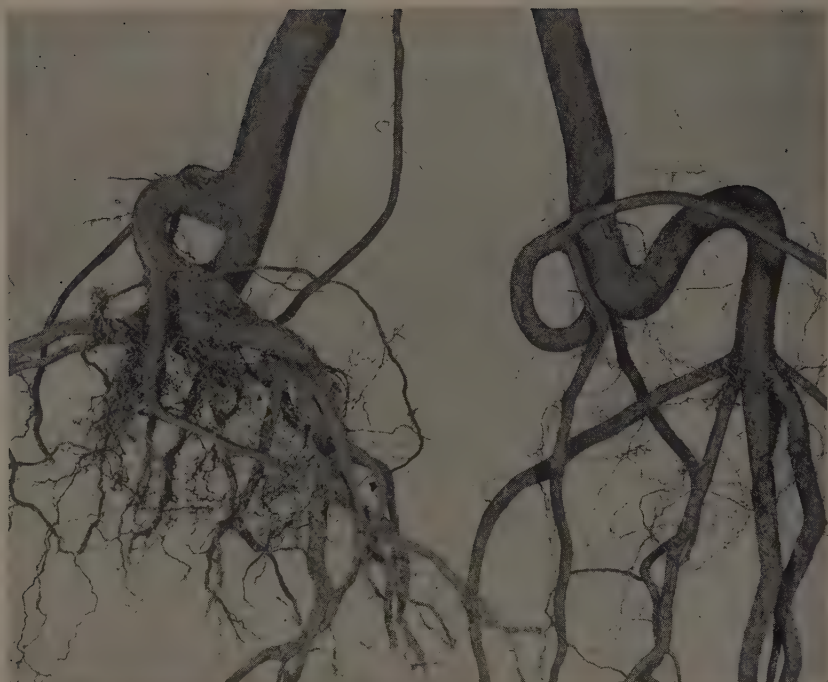
The intercounty nursery stock certificate program was started in 1943 to facilitate the movement of nursery stock within the State without inspection at destination. The certificates may be used by nurseries meeting strict requirements of pest cleanliness. The agreement with county agricultural commissioners for their use on shipments of nursery stock to 56 of the 58 counties within California was renewed and approved by the director. Approval to issue the certificates was granted to four additional counties. The number of nurseries authorized to use them totaled 689 firms operating in 875 locations at the end of the year.

Plant Registration and Certification

Section 120.5 of the Agricultural Code gives the director the authority to adopt regulations for the registration and certification of propagating sources and nursery stock inspected and tested for pests. Nursery Service is conducting four programs under this section. All are optional, and are supported by fees paid by the participants for the services rendered. The regulations for each specify procedures for the inspection and testing for virus diseases which are difficult to find by ordinary inspection methods.

Citrus trees found free from any suspicion of infection by the virus disease known as psorosis or scaly bark may be registered as root or top-stock sources for the propagation of nursery stock. A total of 182 trees is currently registered. Inspections for symptoms are made during spring growth flushes, and the inspections are supplemented by indexing when necessary. The need for indexing increased because of the difficulty of detecting leaf symptoms of psorosis in certain areas in Ventura County and the Coachella Valley. At the request of the citrus industry, plans were made with staff members of the University of California for the expansion of the citrus registry program to include other virus diseases, and the certification of nursery stock grown from registered sources.

Strawberry certification regulations provide for two kinds of certificates for plants which are true to type and variety, relatively free from virus diseases, and free from harmful nematodes and the red stele disease. Visual inspection supplemented by indexing is required for certified plants. Registry certified plants may be grown only from sources which have been tested by indexing for virus disease symptoms. Marshall, Shasta, and Lassen varieties totaling 15,692,500 plants harvested from 142 acres were certified during the 1956-57 season. Of this total, 8,029,000 were registry certified plants. The total is approximately 7,000,000 less than were certified in the previous season. The slackened demand for plants resulted in heavier culling in packing sheds, with only larger plants being packed. Certification was refused for plants from portions of two increase beds where nematodes were found. A total of seven plant beds were withdrawn from the program because of poor growth of the plants.



Pear trees with twisted roots. Trees such as these are held under Section 1148.3 of the California Agricultural Code.

Cherry trees may be registered as root-stock and top-stock sources for the propagation of nursery stock when inspected, tested, and found free from serious virus diseases by procedures specified in regulations established in 1956. Trees eligible for registration were grown by the University of California, and distributed to nurserymen for planting in mother blocks in the winter of 1956-57. Varieties of cherries released to nurserymen included: Bing, Black Tartarian, Royal Ann, Lambert, Republican, Van, and Montmorency. Registration of a total of 90 cherry trees in three mother blocks has been requested by nurserymen. The University of California has also requested registration of 14 cherry trees to be maintained in a screenhouse on the Davis campus. Regulations are planned for the certification of cherry nursery stock propagated from the registered trees. A limited supply of certi-

fied stock may be available in the winter of 1959-60.

A program, similar to that for cherries, was adopted in 1956 for the registration of parent sources of grapevines. The varieties of grape foundation stock distributed by the University of California at Davis, and now established by nurserymen in eight registered mother blocks are: St. George, AXR-1, 1613, Delight, Emperor, Rish Baba, Scarlet, Cabernet Sauvignon, Carignane, Chenin blanc, Feher Szagos, Chardonnay, Grenache, Sylvaner, Thompson Seedless, French Colombard, Green Hungarian, Johannisberger Riesling, Muscat Hamburg, Sauvignon vert, Gamay Beaujolais, Canner, and Ribier. A number of varieties originally entered in the program were discontinued when virus symptoms were found in the stock. Two of the mother blocks originally entered were withdrawn by the applicants, and one was dropped by the department.

Licensing

The steady trend of increased numbers of licenses issued for the sale of nursery stock each year continued to a new high mark. The number of sales locations licensed in each of the past five years is as follows:

<i>Fiscal year</i>	<i>Sales location</i>
1952-53	6,328
1953-54	6,472
1954-55	6,676
1955-56	6,720
1956-57	6,996

The activities of two persons previously convicted of fraud and theft in handling nursery stock were investigated; no evidence of violation of agricultural laws was found. The misrepresentation of nursery stock by four different firms was investigated and corrected. Numerous investigations were made to determine the character and good faith of new applicants.

Grades and Standards

Complaints of violations of the old grades and standards law were investigated, and eleven were upheld due to improper labeling as to grade-size, or the sale of dead or dying nursery stock. The complaints were withdrawn when satisfactory adjustments were made by the shippers. Inspections of packaged roses and other plants were made at retail outlets to detect dead and dying plants, and to advise on the care of perishable packaged plants. Some dead or dying plants were found on sale in approximately 50 percent of the retail stores inspected. The violations were corrected.

When the new law became effective, an educational program was started with nurserymen and county agricultural commissioners to familiarize them with the new provisions and to develop uniform pro-

cedures. The new law aided in stopping misrepresentation and the sale of fruit and nut trees with defective roots.

Other Services

The Directory of Nurserymen and Others Licensed to Sell Nursery Stock in California was published and distributed to the nursery trade and other interested persons. The Nursery Service Circular of Information, summarizing the more important California agricultural laws and regulations affecting the nursery business, was revised to cover laws effective as of October 1, 1957. The motion picture "Nursery Practices in California" was shown to groups of nurserymen, inspectors, and pupils in public schools. Colored slides of insect pests were shown to county agricultural inspectors as a part of the training program to aid field men in detecting insects, plant diseases, and noxious weed pests.

At the request of the avocado industry and the Agricultural Extension Service, plans were made for the certification of avocado nursery stock grown under procedures to protect against infection with *Phytophthora cinnamomi*, avocado root rot. Procedures for the growing of such trees were developed by research workers of the University of California.

A summary of pest control treatments for nursery stock was compiled and distributed to commissioners and their inspectors to guide them in making recommendations.

Each year, through the co-operation of nurserymen, a census of fruit and nut trees and vines grown is prepared and distributed. The total trees and vines grown for market in the 1957-58 season showed an increase following the trend of the past several years.

Report of Quarantine Inspections by Counties Based on Reports by County Agricultural Commissioners

County	Interstate				Intrastate			
	Shipments passed	Plants or units passed	Shipments rejected	Plants or units rejected	Shipments passed	Plants or units passed	Shipments rejected	Plants or units rejected
Alameda.....	23,578	3,232,728	227	12,375	4,819	13,987,914	15	53,519
Amador.....	273	8,113	1	25	23	11,214		
Butte.....	3,310	993,842	52	2,220	1,019	1,520,034	126	10,284
Calaveras.....	398	15,472	1	10	386	29,968		
Colusa.....	412	17,211			204	90,652		
Contra Costa.....	10,356	533,729	89	2,333	2,841	704,401	2	4
Del Norte.....	1,039	38,857	2	287	205	11,828	1	1
El Dorado.....	1,082	28,556	7	117	132	40,236	37	219
Fresno.....	6,695	252,381	71	224	6,114	3,668,023	10	110
Glenn.....	731	20,933	1	2	314	53,680		
Humboldt.....	4,702	281,982	30	628	1,423	381,763	7	817
Imperial.....	1,750	114,026	2,157	42,097	426	36,394		
Kern.....	9,098	669,430	58	1,279	2,691	1,872,886	25	476
Kings.....	1,470	20,110	104	108	473	123,419	11	1,056
Lake.....	726	26,283	13	1,116	184	21,891	5	26
Lassen.....	771	19,485			111	9,636	1	1
Los Angeles (Co.).....	126,311	6,226,266	7,991	75,498	9,295	10,188,410	358	40,460
San Diego.....	4,832	333,099	1,191	2,471				
San Pedro (Sta.).....	1,538	40,338	6	12	500	95,127		
Mariposa.....	2,944	157,651	15	180	649	245,502	1	14
Mendocino.....	2,626	47,314	7	234	2,454	88,846	17	132
Merced.....	1,513	312,469	44	823	786	3,138,816	9	6,391
Modoc.....	499	13,521			70	35,456		
Monterey.....	2,341	111,020	163	590	834	8,420,546	15	15
Napa.....	898	84,404	10	84	1,557	417,470		
Nevada.....								
Orange.....	36	1,069			331	44,179	7	1,574
Placer.....	8,348	1,628,352	978	45,747	7,295	8,241,641	1	1
Plumas.....	1,700	376,418	14	125	757	1,810,791	1	
Yuba.....	527				443			
Riverside.....	8,180	3,115,773	741	1,105	4,342	1,821,691	54	7,075

Sacramento.....	13,680	332,066	248	2,624	3,394	48,873,023	4	132
San Benito.....	13,423	18,169	1	3	69	978,596	11	30
San Bernardino.....	13,861	525,126	2,369	9,635	3,182	1,032,295	60	3,544
San Diego (Co.).....	20,640	520,251	757	5,642	4,714	955,888	225	333
San Diego (Sta.).....	641	447,577	384	384				
San Francisco (Co.).....	110	86,798	1	22,000	598	107,820		
San Francisco (Sta.).....	22,893	14,373,944	133	5,122				
San Joaquin.....	7,575	462,639	751	77,035	10,256	55,483,754	1,511	13,235
San Luis Obispo.....	1,730	50,723	4	309	1,729	23,746,031	1	2
San Mateo.....	9,350	7,821,528	78	18,629	4,899	2,324,439	10	628
Santa Barbara.....	3,650	2,284,956	17	35	3,665	2,918,410	4	301
Santa Clara.....	12,758	3,473,682	322	8,333	3,883	27,740,784	108	6,110
Santa Cruz.....	2,683	8,077,937	89	22,142	1,512	12,563,916	41	40,039
Shasta.....	2,204	700,271	18	16	446	653,053	4	16
Siskiyou.....	2,141	221,704		820	220	51,489		
Solano.....	5,091	87,563	36	884	1,020	14,549,624		
Sonoma.....	5,889	381,409	171	2,542	1,096	1,241	11	11
Stanislaus.....	5,691	318,037	341	334	1,783	1,419,382	244	7,553
Sutter.....	1,394	110,264	12	207	1,883	9,061,277	188	77,108
Tehama.....	1,545	27,665			380	117,064		
Tulare.....	2,116	19,449	2	2,003	2,312	769,595		
Tuolumne.....	38	210			39	4,300		
Ventura.....	2,823	2,101,828	20	3,519	8,578	19,016,458	71	566
Yolo.....	1,798	56,424	17	72	702	37,056,029	12	15,269
Yuba.....	932	117,036	11	10,207	503	1,001,920	9	17,303
Totals.....	370,895	61,203,653	19,827	382,707	106,643	317,954,805	3,226	304,255

Bureau of Rodent and Weed Control and Seed Inspection

WALTER S. BALL, Chief

JAMES W. KOEHLER, Assistant Chief

The work of the Bureau of Rodent and Weed Control and Seed Inspection is largely a service function, with the exception of the enforcement of the California Seed Law and the seed screenings regulation.

Authorization to perform rodent and weed control work and seed inspection is found in Sections 100-160 of the Agricultural Code. The California Seed Law is set forth in Sections 910-920. The law providing for the one-variety cotton district is found in Sections 951-954; the law providing for the issuing of permits for rearing nutria is found in Sections 165-165.6. The law providing for the protection and taking of burros is found in the Fish and Game Code, Sections 4187, 4600 and 10930-10931.

Steady Progress in Weed Control

Through voluntary action and statutory provision, weed control in the State has made steady progress during the past year. The development of more effective herbicides has stimulated interest in the control of noxious weeds, particularly perennial grasses. Greater use of the substituted urea herbicides as soil sterilants for nonagricultural or industrial weed control has been reflected throughout the State.

The halogeton and camelthorn programs continue to be of major importance in co-operative state and county programs. A significant change in the halogeton program occurred near the end of the year through adoption of a policy of containing the infestation within its present boundaries, rather than continuation of a program of suppression.

Halogeton, two Italian thistles and Mediterranean sage were added to the list of noxious weeds by the legislation.

Control of disease-bearing rodents was carried on at the same level as in previous years, with emphasis placed on areas of higher human population.

Meadow Mouse Outbreak

In the economic field, the meadow mouse (*Microtus montanus*) increased in numbers, to the extent that a very heavy outbreak occurred. Members of the bureau assisted with various phases of the fieldwork. Mechanical application methods were used extensively and much information was obtained to improve control techniques.

Muskrat control is now considered to be on an operational basis in Imperial and Riverside Counties; investigational work is continuing in the central and northern parts of the State, where unique problems have interfered with effective control.

Other rodents and rabbits presented no unusual problems. The enforcement of the provisions having to do with burros and nutria were transferred to the bureau.

Bureau personnel co-operated with state and federal agencies and county agricultural commissioners on certain phases of control programs. Special assistance was made available to the Department of Agriculture by the Department of Fish and Game and numerous inspections were made to further wildlife protection.

Starlings in California

European starlings appeared in huge flocks in early January, and caused much concern until their departure in mid-March. Observations of movements and feeding habits were made during the three-month stay.

The joint predatory animal control program has continued as in past years between the California Department of Agriculture and the United States Fish and Wildlife Service in co-operation with 36 counties, the Tehama County Predator Association, the San Bernardino County Range Improvement Program, and the Sixth Army. Although losses were generally held at a low level, there were instances of severe depredations

by coyotes. Special effort was made to control small animals in the interest of rabies suppression where the incidence remained high. One hundred fifty-one positive cases in small animals were reported from 31 counties. Ninety-four percent of the cases were recognized in skunks.

The number of predators taken in 1957 totaled 21,462, as compared to 19,108 in 1956. The predators included bears, bobcats, coyotes, badgers, foxes, skunks, opossums and raccoons. Of this number 6,665 were coyotes, and 3,816 skunks, a higher take of these two predators than in 1956.

Seed production continued to expand, bringing about a greater demand on the bureau with respect to the enforcement of the California Seed Law, the seed laboratory, and the seed screenings provisions. During the past year, the laboratory handled all of

the work, and very few samples were sent to commercial seed laboratories. This development was due to the slow movement of seed, thus spreading the work over a longer period of time. The official enforcement work continued to increase. The Los Angeles branch laboratory handled all of the seed quarantine work in the southern area, which takes in the 10 southern counties. Plant identification work was carried on in both the Sacramento and Los Angeles offices of the bureau, with 1,084 plants identified in Sacramento, and 443 in Los Angeles, giving a total of 1,527 plant identifications.

Assistant Chief Employed

An assistant chief was added to the bureau staff late in 1957. Other changes were the retirement of the weed and seed botanist and a seed analyst 3, the latter in the Los Angeles office.

WEED CONTROL

MURRAY R. PRYOR, *Field Supervisor of Weed Control*

Aiming at a greater concerted effort through voluntary action and statutory provision, the regulatory weed control situation in the State shows steady progress.

The great strides in the development of newer and more effective herbicides in the field of agricultural chemicals is reflected in the noxious weed programs of the counties. Systemic herbicides, such as dalapon, have stimulated greater interest in the control of difficult perennial grasses. Notable is the expansion of noxious weed control in Yolo County, where growers and an irrigation company are co-operating in Johnson grass control. Such county programs have either been voluntary or have combined voluntary and regulatory action.

Newly registered herbicides are cited in the Bureau of Chemistry's annual report.

Other Herbicides

A review of the herbicide situation for the year 1957 shows the following:

Demand for hormone-type weed killers, in general, is declining; exceptions being the isopropyl amine salt of 2,4-D with isopropyl amine salt of citric acid, the emulsifiable acid of 2,4-D, and 2,4,5-TP (2,4,5-Trichlorophenoxy propionic acid).

Amino triazole greatly increased in use; arsenic trioxide slightly increased in demand; the decline in straight borates levelled off. Demand for borate-chlorate mixtures gradually increased; borate substituted urea combinations and borate-2,4-D combinations were in strong demand.

Chlorates. Graduate downward trend continued. Carbon bisulphide, the demand was slightly upward. At least 1,182,700 pounds of carbon bisulphide were used for noxious weed control in Fresno, Kern, Kings, Merced and Monterey. The bulk of the carbon bisulphide applied (approximately 97 percent) was used for control of morning glory, and the balance was for knapweed, Johnson grass and other weeds.

The use of dalapon rapidly expanded; contact dinitros increased in use, primarily in desiccation of seed crops; selective dinitros were steady in demand, being used for weed control in onions in Salinas and Imperial Valleys, and in the Sacramento San Joaquin Delta, and for selective weed control in cereals in the San Joaquin Valley, where use of hormone-type herbicides is restricted in certain areas.

The use of erbon was slightly increased. In IPC, there was limited usage, but substantial increase over previous year, the granular form showing added uses.

For Chloro IPC, the demand increased, granular form showing added uses; in aromatic weed oils, there was substantial increased demand reflected in usage throughout the State, especially from Bakersfield northward; for ammonium sulfamate, the demand was limited but continuing; in urea herbicides, the demand for monuron increased. Greater interest in the material was shown by governmental and private users for industrial or nonagricultural weed control. Diuron was in upward trend; greater use was reflected in the central and northern sections of the State.

Special Weed Problems

Austrian Fieldcress (*Rorippa austriaca*). Current operations consisted entirely of surveying and observing 2,4-D soil sterilant plot trials for the control of this weed.

Evidently as a result of weather and other conditions, there was a total absence of Austrian Fieldcress seed production during the past growing season. Although there was no control work during 1957, Austrian Fieldcress began appearing in several hundred acres of lands recently converted from natural meadows to improved pastures. Plans call for this area to be sprayed with 2,4-D by aircraft next spring.

The extensive conversion of meadows to small cereal grains in previous years, the recent developing of improved pastures, and the widescale use of 2,4-D as a herbicide has hastened ultimate eradication.

Camelthorn Treatment

Camelthorn (*Alhagi camelorum*). The 180-acre camelthorn infestation in Afton Canyon, San Bernardino County was again treated with an aerial 2,4-D spray during the summer of 1957. This application was made primarily for the purpose of seedling control as the small number of old established plants can be easily sprayed by hand. Numerous seedlings have been found in the canyon where conditions have been favorable for their germination.

Aerial application of the low, volatile ester of 2,4-D at four pounds of acid equivalent in 10 gallons of water per acre has proved as successful in the 10-acre Hinckley infestation west of Barstow, as the aerial application in Afton Canyon. The infestation was so reduced by the end of summer that treatment was accomplished by hand sprayer.

In Kern County, a total of 10 camelthorn infestations involving 264 plants were treated. Twenty-five man-days were spent on the project, and 16¾ gallons of carbon bisulphide and 26 gallons of one-half of one percent sodium arsenite solution were used.

The progress in camelthorn eradication in Kern County for the past decade may be summed up as follows: In 1947 there were 20 infestations of camelthorn; during the past 10 years 18 new and additional infestations have been found. Ten of the infestations remain, and are now under eradication, with a great reduction in the number of plants in each location.

Other Weed Problems

Barb goat grass (*Aegilops triuncialis*). Probably the only known infestation of barb goatgrass in the Coast Range was reported

recently to the department from Sonoma County. The infestation, scattered on about 500 acres of a 3,500-acre sheep ranch east of Santa Rosa, presents a serious range weed problem. Control burning was attempted, but an extensive burning program was precluded by extremely dry range conditions.

The Sonoma County Department of Agriculture, co-operating in the control of this new pest, sprayed infestations with weed oil on a utility right-of-way and two private roadside infestations adjacent to the ranch. This once fairly localized pest, collected as early as 1917 near Clarksville, El Dorado County, in the Sierra Nevada foothills, and subsequently found in Calaveras, San Joaquin and Stanislaus Counties, now poses a more serious threat to rangelands in the State through its establishment in this new and far removed location.

Distaff thistle (*Carlthamus lanatus*). Reflecting greater awareness of range weed problems on the part of ranchers was the formation at the close of the year of a distaff thistle project in San Luis Obispo County.

A propitious beginning for the project seems assured, for 95 percent of the landholders with infestations of distaff thistle have expressed to the county agricultural commissioner a definite desire for the control of this serious weed pest. Under the newly formed program, the county department of agriculture will furnish the spray equipment, plus the operator, to the landholder where assistance is requested. The latter, on the other hand, is required to have one man on the job and pay for the material. The herbicide, 2,4-D will be the main material used in the work.

Gorse (*Ulex europaeus*). Marking the first distribution of field reared gorse weevil (*Apion ulicis*) in California was the release of 1,050 adults in the Blue Lakes District, Humboldt County, in August by James K. Holloway, Entomologist, U. S. Department of Agriculture. Progeny of weevil received from France in 1953, subsequently reared in the Insect Identification and Parasite Introduction Laboratories at Albany, and released to Mendocino and San Mateo County sites in 1954, are thriving under local conditions. Gorse weevil at Caspar, Mendocino County, have multiplied to such an extent that they have spread for at least a half mile from the release point.

Field observations show the weevil readily parasitizing gorse seed. With this favorable development, the biological control of the

seed seems a certainty. Because gorse has readily adapted itself to our coastal climate, and in many places has invaded rugged mountainous areas where chemical control is not feasible, it is a serious range pest. Hence, it is felt that biological control will play a major role in retarding the spread of this aggressive plant into range and forest lands. Presently gorse weevil colonies are established in San Mateo, Marin, Mendocino and Humboldt Counties.

Halogeton glomeratus. A significant change in the control of halogeton, an aggressive poisonous weed, went into effect at the end of the year. The Lassen County Board of Supervisors, wishing to modify the program of all-out control which had been in effect since 1952, asked the department to consider realignment of the program.

It was agreed that a more realistic approach to the problem would be a program of containment rather than suppression. The new strategy will be directed to preventing spread beyond the periphery of the old infestation. Continued survey on a reduced scale will be in effect annually, so that the effectiveness of the new program may be determined, and the spread of halogeton into free areas prevented. Although the Bureau of Land Management will continue its present program, the Sierra Ordnance Depot will treat a reduced area for the coming season.

Results of Halogeton Tests

The State Seed Laboratory's stored halogeton seed longevity germination experiment, in its seventh year, shows the following results: The germination rate of the seeds with papery bracts (black seed) was zero, as was the case in the fourth, fifth and sixth years of the test. The test shows that even under stored conditions this type of seed has a comparatively short life. In this test the papery bract seed had a longevity of three years.

The germination rate for the indurate bract seed (brown seed), as in all former tests, was zero until the bracts were removed. Removal of the bracts resulted in a germination rate of 75 percent, the highest of any previous test. The test shows that under dry stored conditions the indurate bract seed have a long life.

Italian Thistle (*Carduus* spp.). In 1956, as a stopgap measure to help slow down the spread of Italian thistle in the Lompoc

district of Santa Barbara County, the County Board of Supervisors authorized the expenditure of \$1,500 for use on private lands to defray the cost of materials. Not more than three-fourths of the cost of the materials was to be borne by the county. In 1957, \$333.97 of this fund was used, and as a stopgap measure it helped considerably.

Although the present status of the Camp Cooke Italian thistle program is problematical, since the Navy has recently taken control over that part of the camp where the thistle is found, the farmers are continuing an intensive program of spraying and hoeing Italian thistle wherever found on their own properties.

Pest Abatement Districts

The Big Valley Pest Abatement District in Lassen County treated 1,412 acres of hoary cress with 2,278 pounds of 2,4-D as the amine salt, and 331 acres of Russian knapweed with 756 pounds of 2,4-D in the amine form.

Amino triazole was effective in controlling hoary cress when used as a foliage spray, while 2,4-D applied as a soil sterilant at the rate of 40 pounds per acre on hoary cress and Russian knapweed gave good control.

The Lookout Pest Abatement District in Modoc County continued with its Russian knapweed and hoary cress control program. The Modoc County Department of Agriculture also continued with its co-operative chemical weed control trials. Large scale trials were undertaken against Russian knapweed, using 2,4-D as a soil sterilant. Also tests were conducted with single amino triazole foliage treatments and sequence treatments with amino triazole following 2,4-D, with and without cultivation.

With the newly formed Tullake Irrigation District in operation this year, the Stronghold Weed Abatement District was relieved of its responsibility of conducting general weed control work on canal banks in the area. The weed district, centering its attention on noxious weed control, gave full attention to the elimination of quackgrass.

Weed-free Areas

The Palo Verde Valley Russian Thistle Noxious Weed-Free Area, proclaimed by the Director of Agriculture in February, 1943, is showing good progress. The district, located in Riverside County and comprising 90,000 irrigable acres, was established

to provide more and quicker authority for the elimination of Russian thistle (*Salsola kali*) in the area. A survey of the results up to date show: (1) no new infestations for 1957; (2) only one active infestation of 15 plants; and (3) 50 percent of the total infestations considered to be eradicated. There is less Russian thistle in the district today than 15 years ago, in spite of continually increasing agriculture and commercial activity in the area.

Weed Control Meetings

The ninth annual California Weed Conference held at Fresno January 22d to 24th was devoted to the consideration of a wide variety of topics, including weed control problems of San Joaquin Valley, local agricultural weed problems, local weed problems on noncropped areas, research in weed control in California and upon a national basis, watershed management in relation to California's supply, noxious weed control, roadside weed control, brush control, what's new in weed control, aquatic weed control, and intrastate movement of weed seed infested grain.

A series of weed symposia were held at Los Angeles, Bakersfield, Fresno, Sacramento, San Jose and Santa Rosa by the statewide weed committee of the California State Chamber of Commerce. The committee, originally sponsored by the California Weed Conference, is composed of 44 members and five technical advisors, and represents each segment of the State's economy and geographical area.

The annual halogeton meeting was held at Susanville on April 9th. Represented were the California Department of Agriculture, the Lassen County Department of Agriculture, Lassen County Board of Supervisors, the Nevada Department of Agriculture, the Southern Pacific Company, the Sierra Ordnance Depot, the Western Pacific Railroad, the Bureau of Land Management, and private property owners by two ranchers. It was agreed that the county agricultural commissioner would continue as co-ordinator of the halogeton project, and that all co-operators should begin timely spray operations.

Weed Control by State Division of Highways

The California Division of Highways allocated \$93,214.67 for noxious weed control, \$128,447.53 for fire hazard control and \$61,-

685 for maintenance weed control along state highways.

Approximately 3,500' miles of roadside area was sprayed, disced or burned for fire hazard control and areas amounting to over two million square yards were treated for maintenance weed control.

SUMMARY OF EXPENDITURES FOR WEED CONTROL FROM REPORTS OF 52 AGRICULTURAL COMMISSIONERS

Alameda	\$8,017.12
Amador	5,554.84
Butte	—
Calaveras	1,217.72
Colusa	35,280.65
Contra Costa	13,493.96
Del Norte	3,095.39
El Dorado	2,473.30
Fresno	184,653.03
Glenn	13,819.20
Humboldt	12,798.84
Imperial	519.58
Kern	592.44
Kings	3,296.51
Lake	2,723.79
Lassen	14,418.87
Los Angeles	59,058.31
Madera	19,013.52
Marin	4,495.13
Mendocino	1,068.84
Merced	16,798.27
Modoc	5,219.78
Monterey	4,320.71
Napa	7,106.25
Nevada	328.00
Orange	26,514.19
Placer	1,259.83
Plumas	3,816.35
Riverside	15,689.01
Sacramento	16,366.19
San Benito	16,890.32
San Bernardino	7,677.24
San Diego	30,047.73
San Francisco	17.28
San Joaquin	86,384.23
San Luis Obispo	16,630.14
San Mateo	3,446.24
Santa Barbara	14,068.97
Santa Clara	5,799.07
Santa Cruz	1,104.55
Shasta	14,663.10
Siskiyou	24,744.11
Solano	8,060.04
Sonoma	6,015.00
Stanislaus	31,057.85
Sutter	7,373.00
Tehama	6,694.13
Tulare	—
Tuolumne	11,626.50
Ventura	3,944.52
Yolo	32,328.02
Yuba	4,627.15
Total	\$816,208.81

MATERIALS USED AND COSTS

Sodium chlorate	27,162 lbs.
Borax	48,519 lbs.
Borate-chlorate mixtures	89,530 lbs.
.....	36,613 gal.
Borate-CMU mixtures	47,067 lbs.
Borate-2,4-D mixtures	16,204 lbs.
Borate-chlorate and CMU mixture	250 lbs.
Petroleum oil	462,338 gal.
Dinitro	1,016 gal.
Carbon bisulphide	107,721 lbs.
Dalapon	18,143 lbs.
Amino triazole	12,152 lbs.
Dalapon and amino triazole mix	1,211 lbs.

Monuron	45,632 lbs.
Diuron	1,073 lbs.
Ammonium sulfamate	2,385 lbs.
Sulphur	11,077 lbs.
TCA	4,400 lbs.
Arsenicals	156 gal.
Erbon	30 lbs.
2,4-D esters	4,616 lbs.
.....	1,292 gal.
2,4-D amine salts	353 lbs.
.....	4,815 gal.
Emulsive acid of 2,4-D	117 gal.
Brushkiller	817 gal.
2,4,5-T	117 gal.

Total cost—\$341,178.82.

PLANT IDENTIFICATION AND SURVEY

T. C. FULLER, *Weed and Seed Botanist*

For the year 1957, a total of 1,527 plant identifications were made. Of these, 1,084 were from Sacramento, and 443 were reported from Los Angeles. Many specimens were accompanied by requests for information concerning growth habits, distribution or poisonous properties.

Border Interceptions

The plant specimens intercepted at the border quarantine stations included viable material of the following noxious weeds:

Noxious weeds	Shipment infested
<i>Solanum elaeagnifolium</i> , white horsenettle	113
<i>Cirsium arvense</i> , Canada thistle	18
<i>Convolvulus arvensis</i> , wild morning glory	7
<i>Sorghum halepense</i> , Johnson grass	7
<i>Cenchrus pauciflorus</i> , sandbur grass	5
<i>Cardaria</i> spp., hoary cress or whitetop	3
<i>Tribulus terrestris</i> , puncture vine	3
<i>Hypericum perforatum</i> , Klamath weed	2
<i>Centaurea repens</i> , Russian knapweed	1
<i>Iva axillaris</i> , poverty weed	1
<i>Centaurea solstitialis</i> , yellow star thistle	1
<i>Cynodon dactylon</i> , Bermuda grass	1
<i>Solanum carolinense</i> , Carolina horsenettle	1

Livestock Deaths

Investigations of livestock deaths from poisonous plants were requested by state and private veterinarians through the county departments of agriculture. Co-operation of the Bureau of Chemistry aided significantly in the proper determination of the toxic principles involved in some of the cases.

The following reports are mentioned because they are new, or because of unusual occurrences of species of special interest:

Aleurites fordii Hemsl., tung-oil tree, produces seeds known to poison sheep and cattle, containing a toxalbumin similar in action to strychnine. Three children were hospitalized in Riverside County as a result of eating these seeds.

Asclepias speciosa Torr., showy milkweed, was responsible for the loss of 20 head of cattle in Modoc County. The range was overgrazed, and the cattle had eaten the milkweed pods, the most poisonous part of the plant.

Brassica arvensis (L.) B. S. P., wild mustard, was a major constituent of barley screenings that caused the death of two calves. Seeds of this species are known to be toxic, but the symptoms suggested heavy metal poisoning. Mercury was found both in the screenings and in the calf's liver.

Cajanus cajan Millsp., pigeon pea, probably an escape from cultivation, was collected in Ventura County.

Cerastium vulgatum L., perennial mouse-ear chickweed, continues to be reported as a turf weed, crowding out *Dichondra*.

Chenopodium album L., lambs' quarters, was the main constituent of a hay sample that had caused death of cattle in Alameda County. The plants must have been over three or four feet high before mowing. Potassium nitrate 8.66 percent was found in the sample; 1.5 percent being the minimum lethal concentration.

Chorispora tenella (Willd.) DC, blue mustard, was identified from Montague, Siskiyou County. This annual crucifer is reported established in two counties in Oregon, but this report apparently is the first occurrence of this species in California.

Cirsium arvense Scop., Canada thistle, rarely sets viable seed in the warmer parts of its range, but a specimen from Fresno County contained apparently viable achenes.

Conium maculatum L., poison hemlock, was responsible for the death of nine calves and drop in milk production of the herd near Tomales, Marin County.

Cressa truxillensis, alkali clover, was identified from seeds washed upon the banks of a flooded barley field being used for duck hunting. As these seeds have little or no food value to ducks, they were of no interest to the members of the Department of Fish and Game which was concerned over possible baiting of the duck pond.

Digitaria Ischaemum (Schreb.) Muhl., smooth crabgrass, continues to be identified in more counties throughout the State, but it is impossible to determine if this extension represents a spread of the weed, or a spread of the knowledge of the differences between smooth and hairy crab grass.

Euphorbia supina Raf., spotted spurge, continues to be reported as a lawn pest throughout the State. Because of its early and prolific seed production, this annual is rarely controlled before a large quantity of seed has been scattered.

Fumaria parviflora Lam., small-flowered Fumaria, was reported as abundant near Escondido, the first record we have of the genus in San Diego County.

Hibiscus Trionum L., flower of an hour, sparingly established in California, but a widespread weed of eastern North America, was found in canned nursery stock in Sacramento.

Juncus phaeocephalus Engelm., brown-headed rush, eaten after a heavy frost and under overgrazing conditions, was responsible for the death of two heifers near Santa Rosa. Tests showed the presence of prussic acid in the plant, the first report known to us in California, although two species are well known as such in Australia.

Leerzia oryzoides (L.) Schwartz, rice cutgrass, infrequent except in southeastern California, was collected near Le Grand, Merced County.

Lepidospartum squamatum Gray, scale broom, a native shrub, was reported from Santa Maria as a weed in barley that was cut for hay. Cattle refused to eat this contaminated hay. Another specimen was considered the causal agent of allergic reactions experienced by a person in the Lancaster area.

Leptochloa uninervia (Presl.) Hitch. & Chase, sprangletop, was reported as quite common in some cotton fields in Kings County. While a common weed in the Imperial Valley, another species, *L. fascicularis*, scale grass, is more frequent in occurrence in the interior valley.

Nothoscordum fragrans (Vent.) Kunth., false garlic, was reported as a pest in flower beds at a nursery in West Los Angeles, at Santa Maria, Santa Barbara County, and at Corona Del Mar, Orange County.

Onopordum acanthium L., cotton or Scotch thistle, was identified from specimens from Alturas,

Modoc County. This thistle has been known for a number of years within the limits of Alturas, but last year it showed some spread into the surrounding area.

Palafoxia linearis Lag., Spanish needle, was collected by a member of the Bureau of Plant Pathology from the base of a tomato transplant in San Joaquin County. The tomato plant was grown in the Mecca area of Riverside County, and the seed or the germinated seedling was transplanted along with the tomato plant. The Spanish needle is known in California only from the Colorado and Mojave deserts.

Raphanus sativus L., wild radish, was identified as the plant probably causing blood in the urine of a goat staked in a weed patch in Los Angeles County.

Solanum aviculare Forst. f., kangaroo apple, was identified from specimens submitted from Fresno and Yolo Counties. If established, these would be an extension of range from the coastal section north from San Francisco. Because of the long linear lobes of the leaves, this plant is sometimes confused with marijuana.

Solanum carolinense L., Carolina horsenettle, was submitted as a specimen from Lodi, San Joaquin County.

Solanum sarachoides Sendt., hairy nightshade, was identified from Sacramento and San Joaquin Counties as a serious weed in first-year alfalfa fields. The first cuttings contained so much of this toxic weed, including the very poisonous unripe fruit, that the hay was rendered useless. Another specimen including green fruit was identified from frozen spinach received at the Mendocino State Hospital.

Trifolium variegatum Nutt., white-tipped clover, was reported as a weed of golf greens at March Air Force Base, Riverside County. This occurrence is the first record we have that this native annual is a weed of any importance.

RODENT CONTROL

LAUREL L. ATKINSON, *Field Supervisor of Rodent Control*

Ground Squirrels

Control of ground squirrels in California continued on about the same level as in the past several years. Increased efficiency in control practices in many areas has resulted in the improvement of operations. More counties are dividing their areas into districts to be worked on alternate years and this arrangement has resulted in better bait acceptance and better landowner co-operation.

A repetition of the 1956 community squirrel drive held in Capay Valley of Yolo County took place in March, with an increase in acreage treated. Strychnine-coated barley was used, and the results were very satisfactory.

Gophers

Crop damage from gophers remains at a high level, especially in areas where spring

irrigation is used. Kern County has suffered heavy losses to seed alfalfa grown under these conditions. The use of poisoned baits has been too slow to cope with the situation. Various experiments with other methods and improvements on present methods are contemplated.

Jackrabbits

Reports of damage and control have been received from counties where young plantings of vineyards and orchards have occurred. Some damage was noticed in cotton plantings, but the heavy overall population experienced in California in the desert areas in 1954-55 has not recurred.

Musk rats

Following the successful trials last year, initiated by the bureau and Riverside County, of anticoagulant rodenticides on

rolled barley bait for muskrat control, the Palo Verde Irrigation District placed approximately 60 floating bait boxes in the irrigation canals; the Imperial Irrigation District is operating more than 300 bait boxes. The boxes are left in one location until bait acceptance ceases; they are then moved to another area. The program has greatly reduced the muskrat population in the treated areas.

Some success was experienced during May and June at a 10-acre pond southeast of Sacramento. Former difficulties in the San Joaquin and Sacramento Valleys, principally caused by wet vegetation deposited in boxes, were not encountered at this time and anticoagulant baits proved effective. Additional experimental work is planned to determine the time of year control work may be practiced in the north state area.

Meadow Mice

During the latter part of 1957, California experienced a very heavy meadow mouse outbreak. The areas in which the greatest populations were found are the Tululake Basin of Siskiyou and Modoc Counties, an area near Likely, Modoc County, a small section of Sierra Valley in Sierra and Plumas Counties, and the Bridgeport and Coleville areas in Mono County. Several minor flare-ups were seen elsewhere in the State, but

these were not on a scale with the others reported.

The mouse involved in this outbreak, *Microtus montanus*, one of many identified in California, is short lived and produces large litters. Estimates on life span are 10 to 16 months. Litter sizes are quite variable, running from 5 to 10, with at least 5 or 6 litters probable from one female, each of which may breed when very young. It appears that the high population came about as a result of a greater than usual number of overwintering mice and early breeding. The vast buildup, which continued throughout the summer and fall, resulted in serious losses.

Control measures were applied on a voluntary basis with direction and assistance from personnel of the State and County Departments of Agriculture, Agricultural Extension Service, and others.

In the Tululake area, zinc phosphide- and sodium fluoroacetate-treated grain baits were applied, mechanically, by hand and by air. One device made ground application up to 35 acres per hour possible under optimum conditions. Principal crop damage occurred to potatoes, alfalfa and alsike clover. Damage to 7,800 acres of potatoes resulted in an approximate loss of \$500,000. Alfalfa damage in some fields was severe, and in a few instances where control was not practiced, or was too late, the fields will have to be replanted. Alsike clover seed production was greatly reduced in many fields, causing substantial losses to growers.

Alfalfa damage and meadow and pasture grass loss in Sierra and Plumas Counties was largely stopped by the use of zinc phosphide-treated baits.

Zinc phosphide-treated oats were used on a part of the 20,000-acre Bridgeport meadow with effective control. Only the most severely damaged areas were treated, requiring about 35,000 pounds of the bait, mixed under supervision of the State Department of Agriculture and on the spot by volunteer help. It is estimated that from \$25,000 to \$50,000 of cattle forage was lost in this meadow area. Earlier estimates of damage were borne out in severe losses to 5,000 acres, moderate losses to 10,000 acres and lesser losses to an undetermined acreage. Treatment made by hand and with mechanical applicators in the area resulted in covering not more than 25 acres per day because of rough terrain.



Microtus damage to Tululake potatoes

Meadow, alfalfa and clover were the principal items damaged by mice in the Coleville area. Control work, begun late, involved supplying bait through the United States Fish and Wildlife Service co-operating with the Agricultural Extension Service in Nevada. Control strategy was outlined at two grower meetings by a representative of the California Department of Agriculture.

The California program provided a measure of relief to all persons who asked for assistance in combating the mice. It is be-

lieved that control effectiveness ranged from fair to excellent. According to the Agricultural Commissioners of Siskiyou, Modoc, Sierra, and Plumas Counties, a total of 130,000 pounds of grain bait was applied to an area of 20,000 acres. In Mono County, approximately 50,000 pounds of bait materials were applied to 6,250 acres. All baits exposed for control of mice were dyed in accordance with earlier recommendations of this bureau.

BIRD DAMAGE

Blackbirds have caused heavy damage to lettuce and cabbage in Imperial County in areas where the crops were adjacent to live-stock feed yards which harbor the birds. In one case, 40 acres of lettuce worth \$4 per crate was damaged to the extent that it could not be harvested. In severe cases the birds will eat more than half the head of lettuce. One or two bird pecks are sufficient to cause a mature cabbage head to burst. Several acres of cabbage near the Town of Imperial were not harvested because of bird damage. Control measures were limited to frightening the birds from the feed yards, thus causing them to disperse in the surrounding countryside.

Sparrows

Complaints of sparrow damage continue to arrive from poultry producing areas, where the birds consume feed. They are suspected of transmitting mites and certain diseases. Successful control is achieved only by the close co-operation of neighboring poultry producers.

Horned Larks

Heavy damage by horned larks was experienced in Tehachapi Valley to plantings of seed alfalfa and sugar beets grown for seed. Excessive damage occurred to vegetable crops, and, especially to tomatoes on the west side of the San Joaquin Valley, where the seed is field planted, and sprouted by irrigation. Frightening devices gave little or no relief, and experiments were carried on with dusts as repellents. This latter practice is being continued experimentally.

European Starlings

The early winter appearance of greater-than-usual numbers of starlings caused much

speculation this past year. Large flocks were discovered in January in the Lodi and Thornton area of San Joaquin County by members of the San Joaquin County Agricultural Commissioner's Office. Subsequent inspections revealed that many thousands of these birds were feeding on insects and gleaned dried grapes remaining on the vines. The commissioner's staff soon observed mass departures to the west each afternoon toward dusk, and a return early the next morning. Many of these flocks looked much like black cloud masses of tumbling irregular shape as they approached. Single flocks often contained 25,000 to 50,000 birds. Regardless of the great numbers present it is believed that the exodus was complete by March 15th or earlier. A storm period prior to that date masked that area and much of the central State, so that continued observations were not possible.

On October 1st the birds were seen in the Sacramento Valley, and reports since indicate their presence throughout all of the districts formerly visited, and including new areas with flocks of a thousand birds seen; in one instance perhaps 25,000 were present. There were no reports of the great numbers seen earlier in the year in San Joaquin County.

Starlings have been known to damage agricultural crops in the eastern states, but have caused no reported damage in this State during their winter stay.

Other depredations from injurious bird species continue in certain areas, and control was carried on when damage and conditions warranted.

Table 1 denotes the extent of economic rodent and bird control as reported by county agricultural commissioners:

TABLE 1

Pest animal	Area treated	Expenditures (dollars)	Sodium fluoroacetate bait lbs.	Strychnine bait lbs.	Zinc phosphide bait lbs.	Thallium sulfate bait lbs.	Anti-coagulant bait lbs.	Carbon bisulphide lbs.	Jute waste balls	Methyl bromide lbs.
Ground squirrels	4,784,796 1/4 acres	\$399,628.93	194,623	66,076	42,494	5,941	1,700	158,523	246,128	6,135
Rats and mice	10,788 premises	22,843.11	489	306	14,299	-----	42,324 1/2	-----	-----	-----
Gophers	86,243 acres	19,097.02	472 1/2	32,590 1/4	-----	-----	13 1/2	-----	-----	-----
Meadow mice	43,794 acres	11,272.46	93,401	3,480	52,247	-----	2,548 1/2	-----	-----	-----
Jackrabbits	25,436 1/4 acres	1,853.36	-----	8,060	105	-----	15	-----	-----	-----
Kangaroo rats	24,627 acres	1,324.70	-----	3,237	-----	-----	-----	-----	-----	-----
Badgers	282 acres	104.58	-----	5	-----	-----	-----	-----	-----	19 1/4
Moles	556 acres	*915.81	-----	-----	-----	-----	-----	-----	-----	-----
Blackbirds	92 premises	1,337.49	-----	1,522	-----	-----	-----	-----	-----	-----
Horned larks	386 premises	2,128.07	-----	5,868 1/2	-----	-----	-----	-----	-----	-----
Linnetts	745 premises	1,665.40	-----	3,254 1/2	-----	-----	-----	-----	-----	-----
English sparrows	1,012 premises	2,307.59	-----	3,899	-----	-----	-----	-----	-----	-----
Crowned sparrows	465 premises	658.30	-----	1,208 1/2	-----	11	-----	-----	-----	-----
Crows	28 premises	88.46	-----	-----	-----	-----	-----	-----	-----	-----
Others (miscellaneous)	23 premises	354.00	39	82	-----	-----	-----	-----	-----	-----
Totals	-----	\$464,579.28	289,024 1/2	129,595	109,145	5,952	46,601	158,523	246,128	6,154 1/2

* Includes cost of trapping.

CONTROL OF DISEASE-BEARING RODENTS

Field rodent control for disease suppression in co-operation with the Department of Public Health remains about the same as the past couple of years. This is due to the fact that in most recreational areas, control is only indicated when there is an abnormal buildup of field rodents. Eradication is not considered, nor is it probable in these areas of rough terrain. In these disease areas the following operations have been carried on in co-operation with other official agencies:

SUMMARY OF PLAGUE AREA OPERATIONS FOR 1957

Area treated	1,349,549½ acres
Strychnine bait	10,494 pounds
Thallium sulfate bait	1,596 pounds
Sodium fluoracetate (1,080) baits	38,233 pounds
Zinc phosphide baits	3,914 pounds
Anticoagulant baits	5,415 pounds
Carbon bisulfide	24,187½ pounds
Jute waste balls	55,463
Methyl bromide	637 pounds
	183 cases

Total cost of plague operations for year, \$101,376.61

PREDATORY ANIMAL CONTROL

H. NELSON ELLIOTT, *District Agent*
United States Fish and Wildlife Service

Predatory animal control activities for the protection of livestock, poultry, certain crops such as melons and grapes, and the suppression of rabies continued at about the same level for the past 10 years. An average force of 87 hunters and trappers was employed in the joint program of the Department and the U. S. Fish and Wildlife Service in co-operation with 36 counties, the Tehama County Predator Association, the San Bernardino County Range Improvement Program, and the Sixth Army.

Siskiyou County entered into a co-operative agreement for the first time in almost 30 years, and for the first time Army funds were made available for work on Fort Ord and Hunter Liggett Military Reservations in Monterey County.

Although coyotes, bobcats, and predatory bears are the principal species involved in economic control, there were numerous instances where special efforts were required to control fox, raccoon, skunk, and other small animals to protect poultry and crops.

Rabies Suppression

Special effort also was increased to control small animals in the interest of rabies suppression in much of the State. The incidence of rabies in wild animals remained abnormally high for California with 151 positive cases being reported from 31 counties. Although four cases of the disease in cattle were reported, the fact that 142 cases, or 94 percent of the total cases recognized, were in skunks, might be significant to this comparatively low number. Two cases of rabies in cattle were reported from Madera

County and one each from Colusa County and Glenn County.

Local reduction of small animals, such as fox, skunk, raccoon and opossum, has had no influence on total populations.

WILD ANIMAL RABIES CASES REPORTED DURING 1957

County	Skunk	Fox	Raccoon
Alameda	1	---	---
Amador	3	---	---
Butte	3	---	---
Calaveras	1	---	---
Colusa	6	---	---
El Dorado	14	---	---
Fresno	---	2	---
Glenn	6	---	---
Lake	5	---	---
Los Angeles	1	1	---
Madera	5	---	---
Mariposa	13	---	---
Merced	5	---	---
Monterey	11	---	1
Napa	6	2	---
Nevada	1	---	---
Orange	1	---	---
Placer	5	---	---
San Benito	2	---	---
San Joaquin	4	---	---
Santa Clara	2	---	---
Shasta	4	---	---
Solano	12	---	---
Sonoma	2	---	---
Sutter	2	---	---
Tehama	7	---	---
Trinity	1	---	---
Tulare	3	---	---
Tuolumne	4	---	---
Ventura	11	4	---
Yolo	---	---	---
Yuba	1	---	---

Small Animals Reach High Mark

Assuming that the number of animals accounted for by hunters employed in the

co-operative program can be accepted as an indication of populations, it appears that the smaller animals are at an alltime high mark in California. With hunter pressure remaining generally at the same level during the past 10 years, the annual take of the smaller animals has risen steadily, reaching an all-time high during 1957. In the interest of rabies suppression, 3,816 skunks were destroyed compared to the previous annual high number of 2,581 accounted for in 1956.

Although losses generally were held at a low level, there were instances of unusually severe depredations by coyotes. Many growers reported little or no trouble, while in certain cases others reported the heaviest ever experienced.

The greatest losses reported occurred along the Calaveras-San Joaquin County line, where 70 lambs were killed by coyotes. In addition, golden eagles killed an estimated 60 lambs in the same area. Instances of lamb killing by eagles also occurred in Humboldt, Tehama, Placer and Contra Costa Counties.

During the past year, cattle- and sheepmen budgeted \$4,000 for coyote control in their San Bernardino Range Improvement Program which provided for the most extensive strychnine baiting program conducted during the past 10 years, and the removal of 273 coyotes with traps. In spite of these efforts, some of the sheepmen reported heaviest losses by coyotes ever experienced during the spring grazing season on the desert ranges. Unusually heavy losses to sheep by coyotes also occurred in sections of Mariposa and Madera Counties.

Co-operative Assistance

Valuable help was given the predator control program by the active interest of the California Woolgrowers Association. Similar credit is due the various co-operating county agricultural commissioners, farm advisers, co-operating officials of the U. S. Forest Service, Bureau of Land Management, National Park Service, military installations, California Farm Bureau Federation and California Cattlemen's Association.

The following is a summary of total funds available for work during 1957.

Agency	Total
State of California	\$204,155.21
Federal	94,251.02
Counties	201,638.77
Association	14,260.00
San Bernardino Range Improvement program	3,072.70
Total	\$517,377.70

Table 2 is a summary of predators taken in 1957.

The following funds were appropriated by co-operating counties effective July 1, 1957, for the fiscal year ending June 30, 1958:

County	Amount
Alameda	\$5,100.00
Amador	4,200.00
Butte	8,232.00
Calaveras	4,958.00
Contra Costa ¹	5,444.00
Del Norte	4,006.00
El Dorado	7,189.50
Humboldt	23,540.00
Imperial	3,600.00
Kern	10,564.00
Lake	5,610.00
Lassen	3,360.00
Los Angeles	5,417.00
Madera	5,040.00
Mariposa	2,430.00
Merced	4,440.00
Modoc	5,316.00
Napa	10,482.00
Nevada	3,360.00
Placer	4,441.00
Sacramento	4,000.00
San Diego	5,100.00
San Joaquin	5,010.00
San Mateo	4,968.00
Santa Barbara	5,400.00
Santa Clara	4,800.00
Santa Cruz	2,406.00
Shasta	10,435.30
Siskiyou	5,040.00
Solano ²	4,407.00
Sonoma	10,840.00
Stanislaus ¹	3,660.00
Tulare	5,484.00
Tuolumne	5,103.00
Ventura	4,920.00
Yolo	9,188.00
Total	\$217,490.80

¹ Vehicle furnished by county.

² Does not include mileage.

In addition to the funds made available by co-operating counties the Tehama County Predator Association appropriated \$14,760, and the San Bernardino County Range Improvement program appropriated \$2,500.

TABLE 2
Predators Taken

Hunters paid by	Bear	Bobcat	Coyote	Mountain lion	Badger	Fox	Skunk	Opossum	Raccoon	Total
State of California	19	836	2,797	-----	304	1,002	883	277	637	6,755
Counties	117	1,265	2,918	-----	299	2,016	2,224	816	1,342	10,997
Association	-----	65	161	-----	12	100	91	-----	146	575
Federal	4	495	674	-----	192	437	618	308	248	2,976
San Bernardino Range Improvement Fund	-----	2	115	-----	5	37	-----	-----	-----	159
Totals	140	2,663	6,665	-----	812	3,592	3,816	1,401	2,373	21,462

SEED INSPECTION

EMRO C. BRUCH, *Field Supervisor of Seed Inspection*

The seed inspection service of the bureau is charged with the administration of the California Seed Law, provisions relating to the seed screenings and one-variety cotton districts of the Agricultural Code, and the maintenance and operation of the State Seed Laboratory. These activities include contact with the seed trade, seed certifying agencies, the seed buying public, and the seed regulatory activities of the county agricultural commissioners.

The bureau is represented on the California Seed Council by the chief of the bureau, the field supervisor of seed inspection, the supervising seed analyst and a seed analyst, grade 3. The purpose of the seed council is to review all seed legislation and to afford an opportunity for the expression of information pertaining to seed.

The field supervisor of seed inspection served as President of the Association of American Seed Control Officials during the year. The association is a national organization of seed law administrators formed to further an exchange of information on seed regulatory matters.

Fieldwork Increases

The fieldwork of seed inspection has increased during the past year. The Los Angeles district, comprised of the 13 southern counties, drew 18 percent more official samples this year as compared with 1956, and is responsible for the majority of the official samples drawn in the State.

The San Francisco district of 16 northern coastal counties has shown an increase of 22 percent in the number of official samples drawn.

The Sacramento district, which is comprised of the 29 remaining counties, submitted 65 percent more official samples over

the previous year. These facts indicate the increased activity of seed inspection during the year.

A series of meetings to instruct county personnel in seed inspection was continued during the year. Meetings were held at Stockton, Modesto, Fresno, El Centro, San Diego, San Bernardino, Los Angeles and Anaheim.

One hundred twenty inspectors attended the "workshops" which included instruction in the techniques of examining samples for noxious weed seed, a demonstration of seed processing and sampling, a discussion of the differences of quarantine and seed law, and instruction in public relations and seed law enforcement techniques.

Lettuce Project

The indexing of official samples of lettuce seed for mosaic content continued during the year. This phase of seed inspection was prompted by sale of the seed with various references to the low percentage of mosaic content. It is reported that commercial plantings of lettuce seed infested with more than one-tenth of 1 percent might not produce a marketable crop if aphid infestations were normal.

To check on label statements relative to mosaic content, the bureau contracted with a private greenhouse operator to grow 3,000 seedlings, for a period of 28 days, from each of 18 official samples of lettuce seed. At the conclusion of this period, the Bureau of Plant Pathology indexed the plantings for mosaic.

All lots indexed were found to be in compliance with the California Seed Law as to mosaic representations.

During the year 1,305 official samples were drawn, an increase of 23 percent over

1956. The samples represented 859 lots of agricultural seed and 446 lots of vegetable seed submitted by agricultural commissioners of the following counties:

Los Angeles	411
Kern	167
Santa Clara	162
San Francisco	130
Fresno	65
Riverside	54
Madera	51
Imperial	29
Humboldt	23
Solano	22
Santa Barbara	20
San Joaquin	19
Contra Costa	17
Yolo	17
Monterey	12
Ventura	11
San Diego	10
Santa Cruz	10
San Bernardino	9
Yuba	8
Lake	7
Mendocino	6
Butte	4
Colusa	4
Kings	4
Shasta	4
San Mateo	4
Del Norte	3
Napa	3
Stanislaus	3
Tehama	3
Calaveras	2
Lassen	2
Sutter	2
Plumas	1
Orange	1
Sacramento	1
Siskiyou	1
Sonoma	1

Two hundred twenty-eight, or 26½ percent, of the lots of agricultural seed sampled were in violation of the California Seed Law in the following respects:

Mislabeled as to	Instances
Germination	69
Inert matter	65
Purity	55
Other crop	25
Weed seed	19
Date of test	12
Miscellaneous false statements	12
Sum of germination and hard seed	7
Name	6
"Certified"	2
Food	2
Noxious weed seed	2
Other violations	
Containing primary noxious weed seed	2

Forty-six, or 10 percent, of the lots of vegetable seed sampled were in violation of the California Seed Law in the following respects:

Mislabeled as to	
Germination	19



Seed Analyst Martha Chan checks germination test in daylight germinator

Not labeled as to	
Date of test	22
"Below Standard"	21
Germination	15
Address of vendor	2
Name	1

There were 2,141 "stop-sale" orders issued during 1957. "Stop-sale" orders were issued for the following violations:

	Instances
Germination test outdated	1,600
Incompletely labeled	263
Unlabeled	200
Mislabeled	155
Date of shipment outdated	47
Treated seed without appropriate warning	16
Label not legible	8
Containing primary noxious weed seed	1

During the year three complaints were filed. Pleas of guilty were entered in all cases resulting in (1) a six-month suspended sentence with one year probation, (2) a \$50 fine and (3) a \$250 fine, plus a \$750 fine suspended together with two years probation, respectively.

The California Crop Improvement Association Trust Fund

The bureau continued to supervise the regulatory phases of seed certification performed by the various county agricultural commissioners. This service is authorized by Section 916.1, Agricultural Code, and financed by the California Crop Improvement Association through a trust fund agreement with the Director of Agriculture.

The agreement provides funds for the department to employ a district supervisor of seed inspection to supervise the regulatory phase of seed certification performed by county personnel. The trust fund also provides for the employment of a seed an-

alyst, grade 1, to assist in the seed testing at the Branch Seed Laboratory at Davis, which is equipped and maintained by the association.

Federal-state Seed Laboratory

A 2 percent increase in the number of tests made by the Sacramento laboratory made 1957 the busiest year of record.

Several series of investigational germination tests were noteworthy. The germination of broomrape, *Orobanche Ludoviciana* var. *Cooperi* (Gray) G. Beck, was studied in co-operation with the Bureau of Plant Pathology. A study of the toxicity of certain germination trays was made, and reported in the "Newsletter" of the official seed analyst association. A number of germination tests were made on weed seeds which had been subjected to different degrees of dry heat. Longevity studies were made on seed of Russian thistle, wild annual beet, charlock and halogeton. Various methods of germinating seed of Italian thistle, *Carduus pycnocephalus* and *Carduus tenuiflorus*, were also studied.

The general efficiency of the germination room of the seed laboratory was improved by the purchase and installation of an automatic dishwasher.

Co-operation With U. S. D. A.

Co-operation with the United States Department of Agriculture in the testing of

federal samples and in the enforcement of the Federal Seed Act was maintained as in previous years. An increase in federal financial support in the operation of the Sacramento seed laboratory was a result of a thorough cost accounting.

During 1957, the laboratory tested for the Federal Government 573 samples of imported seed requiring 1,112 tests, and 225 other miscellaneous federal samples requiring 405 tests. This is a reduction of 19 percent in the number of samples tested and 17 percent in the number of tests made in comparison with 1956.

State and county personnel reported 39 lots of seed suspected of having been shipped in interstate commerce in violation of the Federal Seed Act. Letters of warning have been issued the shippers by federal authorities for 17 of the lots and action is pending in reference to 21 of the lots.

Fees and Tests

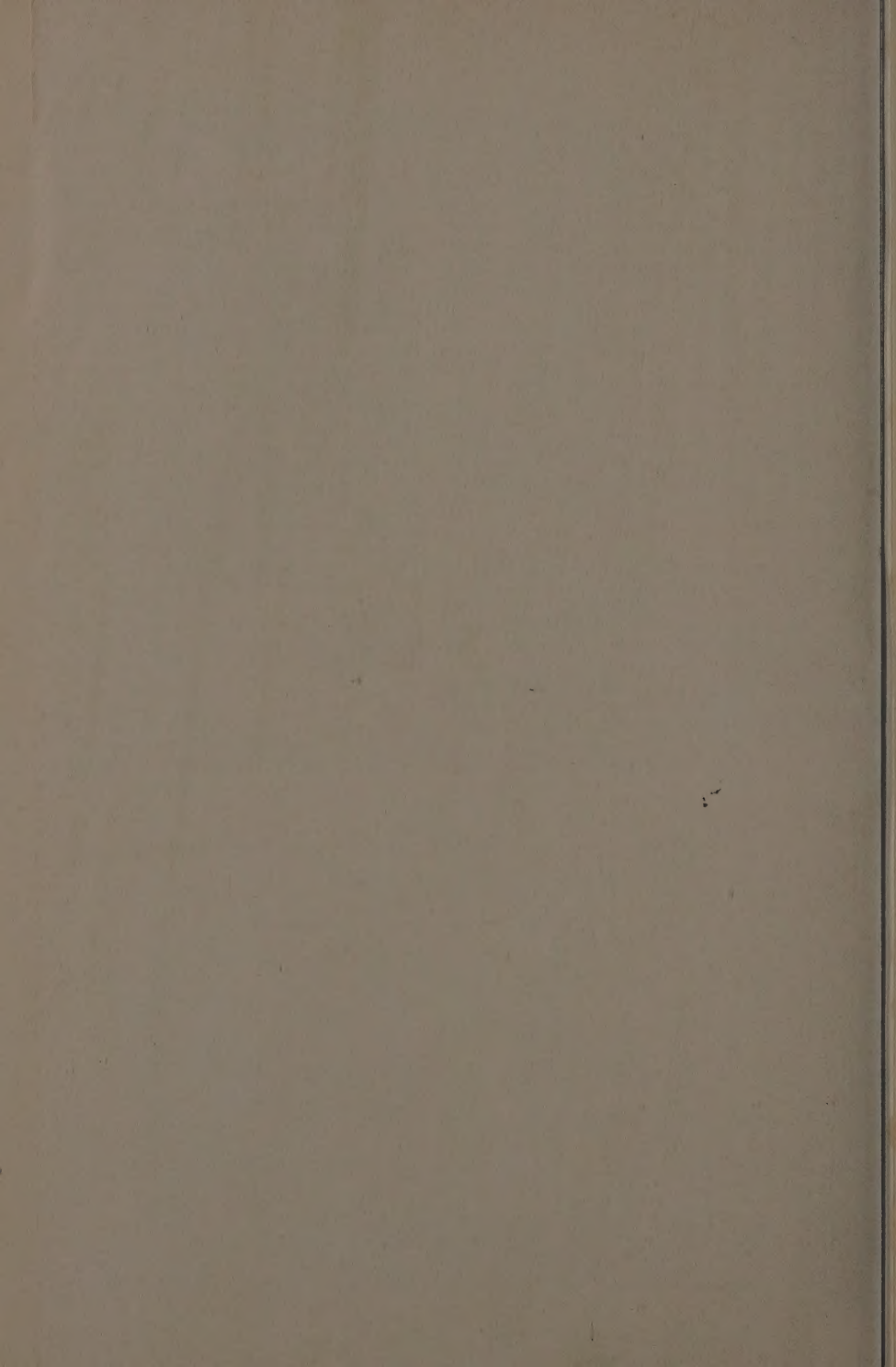
Fees amounting to \$43,771.50 were collected on 7,419 service and certification samples, on which 3,977 purity tests, 7,031 germination tests and 651 noxious weed seed examinations were made. The increase of approximately 13 percent in revenue was due to 1957 being the first full year of fees collected under the revised schedule of fees.

The accompanying table summarizes the work, exclusive of federal testing, of the state seed laboratories for 1957.

TABLE 3
Tests

	Number of samples	Purity	Germination	Identification	Noxious weed seed examinations	Total tests
Sacramento Laboratory						
Official (California Seed Law)						
Agricultural seed.....	859	863	859	-----	-----	1,722
Vegetable seed.....	446	-----	446	-----	-----	446
Service Samples.....	3,230	463	3,225	1	434	4,123
California Crop Improvement Association.....	4,189	3,514	3,806	-----	217	7,537
Investigational Samples.....	773	212	703	-----	9	924
Quarantine Samples						
Bureau of Plant Quarantine.....	203	-----	-----	1	202	203
Agricultural Commissioners.....	495	-----	2	174	319	495
Total for Sacramento Laboratory.....	10,195	5,052	9,041	176	1,181	15,450
Los Angeles Laboratory*						
Quarantine Samples						
Agricultural Commissioners.....	2,611	-----	-----	54	2,557	2,611
Service Samples.....	20	-----	-----	20	-----	20
Total for Los Angeles Laboratory.....	2,631	-----	-----	74	2,557	2,631
Grand totals.....	12,826	5,052	9,041	250	3,738	18,081

* Identifications and noxious weed-seed examinations are the only tests made at this laboratory.



CALIFORNIA COUNTY AGRICULTURAL COMMISSIONERS

Alameda	Edward K. Strobbridge, Jr., 140 12th St., Oakland 7
Amador	Leland Brown (P. O. Box 74), Courthouse, Jackson
Butte	Fred R. Platt (P. O. Box 1229), Agricultural Bldg., Oroville
Calaveras	W. B. Andahl (P. O. Box 848), San Andreas
Colusa	Fielden F. Swim, 751 Fremont St., Colusa
Contra Costa	A. L. Seeley, Buchanan Field, Concord
Del Norte	L. J. Garrett, Jr. (P. O. Box 605), Crescent City
El Dorado	Lowell D. Mobley (P. O. Box 587), Government Center, Placerville
Fresno	John Wardle Dixon (P. O. Box 801), 1730 Maple Ave., Fresno
Glenn	P. V. Harrigan, Memorial Bldg., Willows
Humboldt	W. Donald Thomas (P. O. Box 486), 833 Sixth St., Eureka
Imperial	Claude M. Finnell, Courthouse, El Centro
Kern	C. Seldon Morley (P. O. Box 946), 2610 M St., Bakersfield
Kings	L. O. Haupt, 280 11½ Ave., Hanford
Lake	Rex Lyndall, Kelseyville
Lassen	E. E. Fix, Memorial Bldg., Susanville
Los Angeles	H. J. Ryan, 808 N. Spring St., Los Angeles 12
Madera	Howard T. McLean, 221 W. Seventh St., Madera
Marin	Thomas W. Peryam (P. O. Box 207), 519 4th St., San Rafael
Mendocino	Theodore Eriksen, Jr., Farm Bureau Bldg., Ukiah
Merced	E. A. Danison, 740 West 22d St., Merced
Modoc	Loring White, P. O. Box 1091, Alturas
Monterey	Peter A. Kantor (P. O. Box 1370), Agricultural Bldg., 120 Wilgart Way, Salinas
Napa	Gene Cornett, 1436 Polk St., Napa
Nevada	Leonard G. Lageson, Memorial Bldg., Grass Valley
Orange	William Fitcher, 9846 S. Harbor Blvd., Anaheim
Placer	W. H. Wilson, 130 Maple St., Auburn
Plumas	Neil A. Overgaard (P. O. Box 45), Plumas County Fairgrounds, Quincy
Riverside	Robert M. Howie, Courthouse, Riverside
Sacramento	A. E. Morrison, 120 Courthouse, Sacramento
San Benito	Ward B. Saunders, Courthouse, Hollister
San Bernardino	H. A. Crane, 566 Lugo Ave., San Bernardino
San Diego	Dean F. Palmer, Bldg. 2, 4005 Rosecrans St. (P. O. Box G), San Diego
San Francisco	R. L. Bozzini (acting), Agriculture Bldg., Embarcadero at Mission, San Francisco
San Joaquin	Austin Mahoney (P. O. Box 1809), 1868 E. Hazelton Ave., Stockton
San Luis Obispo	Thomas Chalmers (P. O. Box 637), 1025 Palm St., San Luis Obispo
San Mateo	Max J. Leonard (P. O. Box 1009), Agricultural Bldg., Redwood City
Santa Barbara	Walter S. Cummings (P. O. Box 127), County Office Bldg., Santa Barbara
Santa Clara	David T. Rayner, 227 N. First St., San Jose
Santa Cruz	Matt Mello (P. O. Box 590), 1430 Freedom Blvd., Watsonville
Shasta	C. Bruce Wade (P. O. Box 707), County Office Bldg., 1835 Placer St., Redding
Sierra	Neil A. Overgaard (Acting) (P. O. Box 45), Quincy
Siskiyou	Jess R. Grisham, Courthouse Annex, Yreka
Solano	George A. Pohl, Library Bldg., Fairfield
Sonoma	Percy F. Wright, 912 Santa Rosa Ave., Santa Rosa
Stanislaus	Milo M. Schrock (P. O. Box 2015), Agricultural Bldg., Modesto
Sutter	T. D. Urbahns, 142 Garden Way, Agricultural Bldg., Yuba City
Tehama	S. T. Ancell (P. O. Box 30), Agricultural Bldg., Red Bluff
Tulare	E. O. Mankins, Rm. 12-E, Courthouse, Visalia
Tuolumne	Edw. J. Bigelow (P. O. Box 475), Veterans Memorial Hall, Sonora
Ventura	Chester J. Barrett, 815 Santa Barbara St. (P. O. Box 889), Santa Paula
Yolo	Charles H. Hardy (P. O. Box 175), Agricultural Center, Woodland
Yuba	Arthur W. Worledge (P. O. Box 264), 1420 I St., Marysville

The following counties have no agricultural commissioner:

Alpine, Inyo, Mariposa, Mono, Trinity.



California Department of Agriculture Building, 1220 "N" Street, Sacramento

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DR. A. G. BOYD, *Assistant Director*

CHARLES V. DICK, *Assistant Director*

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Francis G. Stoffels, *Assistant Personnel Officer*
Clifford Clower, *Photographer*
Merle Hussong, *Information Officer*
Robert H. Anderson, *Assistant Information Officer*
Anne Marie Wise, *Supervisor of Central Services*

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V. P. Entwistle, *Assistant Chief*
Bureau of Chemistry
R. Z. Rollins, *Chief*
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